Chemical Week

October 17, 1953

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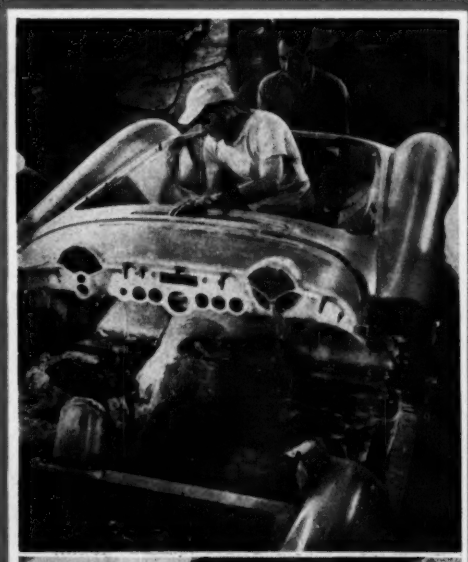

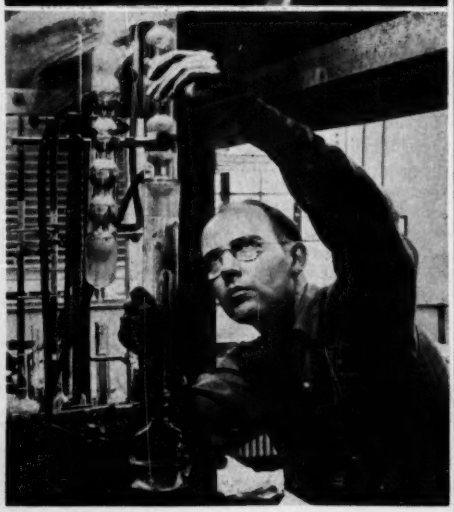

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Companies jettison casual air toward export, drive for more overseas sales . . . . . p. 46

Boost research by bolstering researchers' morale; CW roundup highlights how . . . . . p. 54

Ortho, meta and para—now all the xylenes are slated for big-league markets . . . . . p. 73

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Chemical Week

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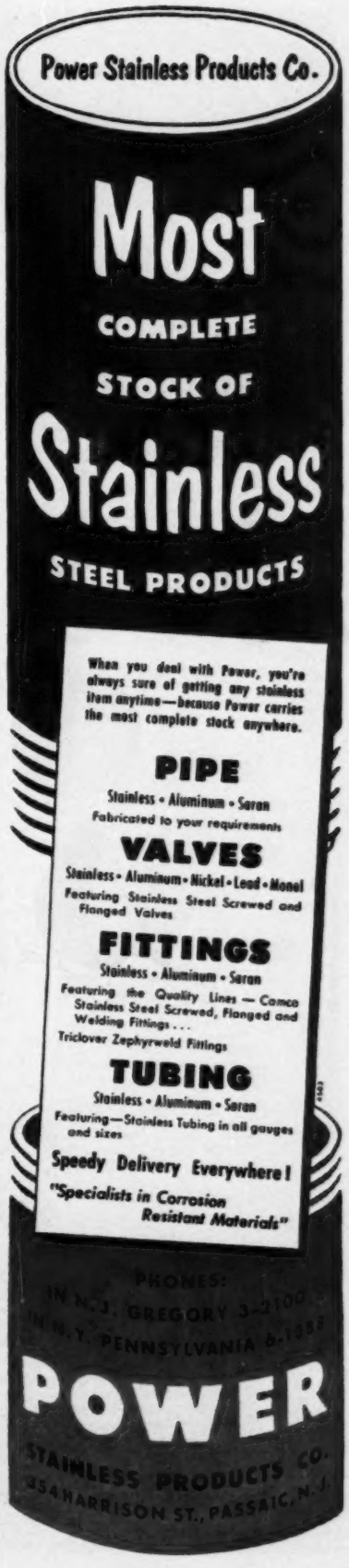
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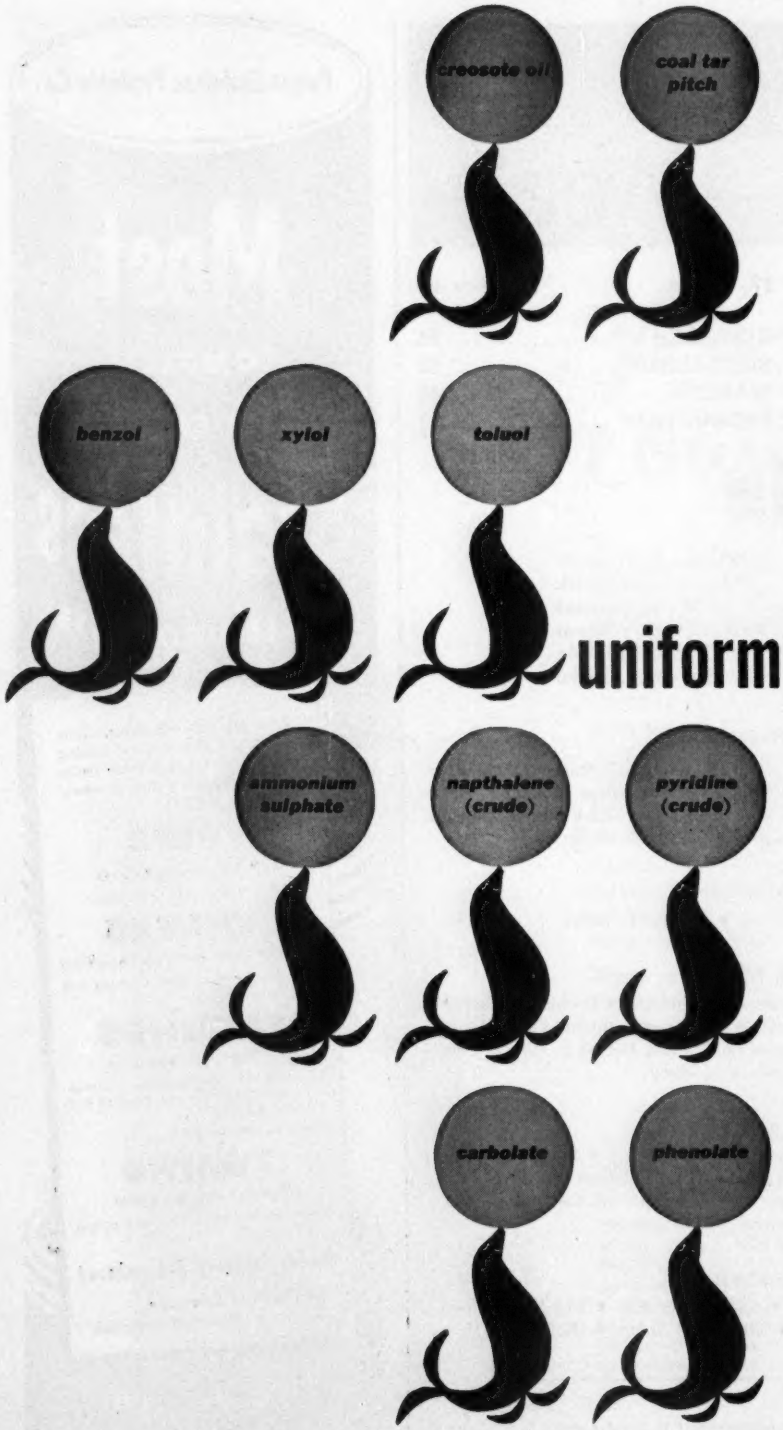

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OPINION....

Chemicals for Coolers

To THE EDITOR: Air conditioning is generally considered to be solely an electric power user. It has been so, up to the present . . . But the time is coming, in my opinion, when much more emphasis will have to be placed on the use of chemicals such as solid adsorbents—silica gel and activated alumina—and hygroscopic liquid absorbents, such as lithium chloride and triethylene glycol solutions to absorb moisture and reduce the power required for removing the latent heat load . . . This might be a subject worth investigation by CW . . .

Almost every week we hear of utilities planning to expand their power generating capacities. Much of this increased power demand will be due to refrigeration air conditioning. There are, of course, two main classifications of equipment: small, portable air-cooled room units and large, central water-cooled installations . . .

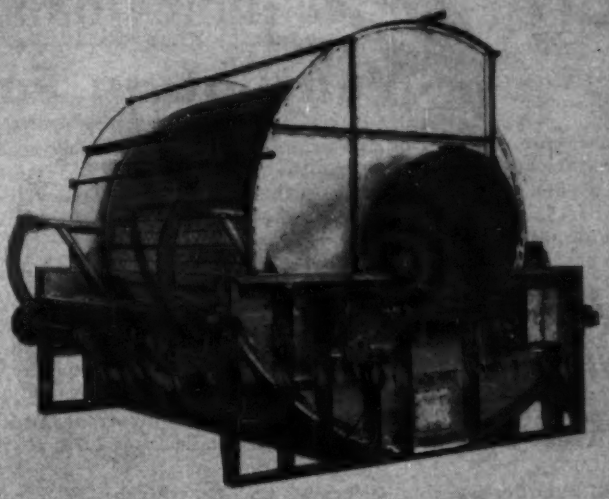
One merely has to look up at the windows of large apartment and office buildings in New York (and for that matter in other cities) and count the room coolers jutting out beyond the sills to realize how fast this market for power is expanding . . . Many old structures are simply not adapted to central air conditioning units . . .

Most of the big central installations for single or multiple floors or for whole buildings . . . are not as easily detectable from the street. Only the water cooling towers of evaporative condensers are sometimes visible . . .

Up to the present the electric utilities have welcomed this market for power because it consumes, during a part of the summer, the power equivalent of a winter load. Ultimately it is certain that peak summer demand will surpass winter peak—and the demand will be insistent. The utilities dare not risk denying power to the public . . . There must, therefore, be some way to supply energy for air conditioning from another source . . . or find a new use for electrical power in the winter . . . or the power load will be seriously unbalanced. In many cities the heat pump and electrical heating do not offer a solution.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.



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The machine pictured above is typical of the specialized requirements of the process industries. It is a 10 foot diameter by 12 foot face drum type filter with all wood construction on the drum, and an all wood tank. The tank frame is mild steel with lead shield against the wood tank. This filter uses the famous automatic Eimco valve cast of lead to prevent action of acid slurry. Every metal part in contact with slurry is acid resistant.

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This new fan offers: (1) High efficiency; (2) Minimum noise level, over wide capacity range; (3) Full Limit-Load horsepower characteristic; (4) Stable performance from shut-off to free delivery.

Retaining the husky construction which has characterized "Buffalo" fans for many years, the new Type "BL" has some outstanding quality design features.

The Type "BL" fan will be built in standard sizes and arrangements with rotor diameters from 12¼" to 108¾", to handle from 1,000 to 500,000 cfm.

You will want this superbly-performing new fan with the "Q" Factor* on your next job! Write for new Bulletin F-100, which contains complete engineering details, including performance tables and dimensions.

** The "Q" Factor — The built-in Quality which provides trouble-free satisfaction and long life.*

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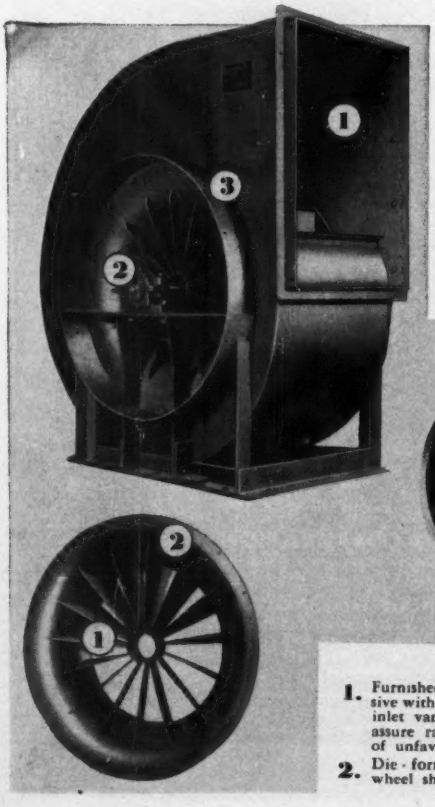

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1. Streamlined housing with outlet designed for most efficient air delivery
2. Anti-friction or sleeve bearings to suit job requirements.
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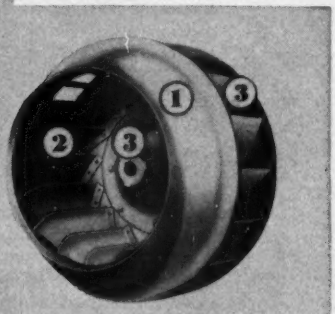
1. Heavy gauge die-formed shroud full curvature for proper air flow in wheel.
2. Die-formed blades curved and backwardly inclined for stable air flow. Welded and riveted for maximum strength.
3. Solid back plate with extra heavy hub.



INLET

1. Furnished as standard, and exclusive with "Buffalo", these stationary inlet vanes reduce turbulence and assure rated air delivery in spite of unfavorable inlet conditions.
2. Die-formed inlet bell matches wheel shroud.

OPINION . . . . . .

. . . Power demand can be greatly reduced by absorptive or adsorptive dehumidification . . . practical only in relatively large units . . . certainly not in room coolers. It appears to me that power demand for room coolers will become so great that it will force electric utilities to promote the use of combination dehumidification and refrigeration units using gas, steam or other sources of heat for the dehumidification load for large units.

The heat wave that seared the country for 10 days before Labor Day broke many records. It also emphasized a significant fact: the seasonal pattern of the electric utility industry was turned upside down . . .

In the simmering New York area alone Consolidated Edison reported a 20% increase in the distribution of electricity—a record for 1953 and the first ever to be set in summer. The pattern was nationwide and U. S. kilowatt output during the scorcher increased a crackling 18% over last year to 8.6 billion kwh.

All told, kilowatt-counting Edison Electric Institute reports 406.5 kwh. were distributed in the 12 months ended May 31, 1953 . . . up 9% from the year before . . . Residential revenues tallied $2.4 billion last year vs $2.1 billion in 1951.

. . . Heavy demand in home appliances is behind the residential demand for electrical power. Con Edison points out, incidentally, that air conditioning units brought in $2.5 million —whereas some two million TV sets added $12 million to total revenues . . .

Although TV sets brought in much more power revenues . . . it should be borne in mind that TV represents a balanced power load summer and winter . . . air conditioning load was all concentrated during a few weeks of the summer . . .

Television sets, and other appliances, contributed to the record power consumption, of course . . . But air conditioning units played far more than a minor role . . .

We might well, I think, as I suggested a few paragraphs back, take a look at the implications this has for chemical makers . . .

C. R. Downs
Consulting Engineer
New York, N. Y.

Tripled Output

To the Editor: I read with real interest your news article "Epoxies on the Ascent" (*Sept. 19*) . . . We share with you the view that the epoxy resin business is in its infancy and that while the development since the

For Example:

NOPCO* lubricants provide needed slip twixt the cup and the lip

During their manufacture, non-collapsible paper cups are formed by drawing the paper stock over a steel mandrel of the proper shape. A specially formulated Nopco product gives the paper stock the "slip" necessary to reduce friction and withstand pressure. Of course, this particular Nopco lubricant must be odor-free and non-toxic.

The applications of other Nopco lubricants are varied and numerous. For wet drawing of non-ferrous wire, rod and tube, a Nopco product doubles the effective life of the lubricating bath, cuts drawing costs. In textiles, thread breakage in sewing operations is minimized, and yarns are lubricated to facilitate processing and eliminate static electricity. The tanning industry lubricates leather with other Nopco chemicals to impart desired softness, and greater tensile strength.

Perhaps we can help you "do it better." Why not see if your own process can be helped, your product improved or costs shaved by the application of a Nopco product. *Our* laboratories and technical service are *yours* to help you make present products better, or aid in the development and manufacture of new products.

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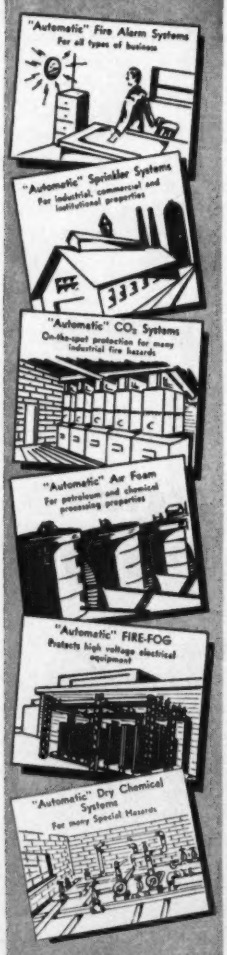
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You've no doubt read or heard from time to time that one or another type of fire protection is the correct answer to your safety problem. One says foam is best. Another says water sprinklers are the answer. Perhaps carbon dioxide, dry chemical, or other media will do the trick.

What is the most effective method?

Without a thorough understanding of all conditions involved, we wouldn't hazard a guess. For fire protection, like any other scientific problem, requires (1) technical know-how, and (2) application of that knowledge. Most methods of fire safety are good . . . but only through "FIRE PROTECTION ENGINEERING"—designing, manufacturing and installing the specific type of system *best by test*—can you be sure of maximum safety.

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OPINION . . . . . .

mid-40s has been substantial, it still has a tremendous potential.

. . . I would like to call to your attention, however, that the only mention of Devoe & Raynolds is: "In 1946, epichlorhydrin producer Shell, under a Devoe & Raynolds license, began marketing epoxies under the tradename, Epon."

While this is factually correct, I am sure that you want to know, and perhaps your readers do, that we are a big factor in the field today. We built our first plant in 1946 . . . have recently completed a plant that will triple our original capacity . . .

Both through our Trade Sales Division and Truscon Laboratories Division we are marketing epoxy resin-based consumer and maintenance products . . . and through Jones-Dabney Division . . . finishes for industrial uses . . .

WILLIAM C. DABNEY
President
Devoe & Raynolds Co., Inc.
Louisville, Ky

Outlook for Epoxies

TO THE EDITOR: I have just read your news article on epoxies (*Sept. 19*) with more than ordinary interest . . . I think it is excellent and well presented . . .

I am particularly interested to note that your data appear to fully confirm my own views on epoxies, as I had occasion to touch on this subject in the CW Report I wrote on the cumene process . . .

HERMAN K. NIEUWENHUIS
Chemical Projects Associates
New York, N. Y.

One Step Forward

TO THE EDITOR: . . . You have been very outspoken about the misuse—or misapplication—of plastics, particularly in toys . . .

I will agree, in general, that such is the case . . . but I think you might also mention that some plastic makers are trying hard to educate molders to use proper products and to use them properly . . .

Enclosed, for instance is an advertisement that stresses that extra-strong plastics are obtainable for use in toys . . . so that they will be stronger and more durable . . .

The trouble is that these resins cost a penny or so a pound more . . . and lots of molders would not pay a nickel a ton more even if it meant improving their end items fivefold . . .

There's a big job of public education to be done . . . Some companies

News from Du Pont...

A NEW HYDROGEN PEROXIDE PLANT OPENS IN MEMPHIS

Fast, Dependable Service to All Users of Albone® Hydrogen Peroxide

The South now has *its first hydrogen peroxide plant*—in Memphis, Tennessee. This new modern plant is Du Pont's third and provides another dependable source for "Albone" hydrogen peroxide. By supplementing the hydrogen peroxide production of the northeast, the Memphis plant assures faster shipments . . . improved service for all users of "Albone."

Today, "Albone" is widely used for bleaching textile fabrics, wood pulp, oil, fats, waxes; and for the synthesis of many organic and inorganic compounds. Its active oxidizing power serves in the formation of peracids . . . in epoxidation and hydroxylation . . . and as a catalyst in polymerization reactions, to mention but a few applications. Since the only by-products from a hydrogen peroxide reaction are water and oxygen, high-purity syntheses are possible.

You'll find interesting facts about "Albone" hydrogen peroxide in a new Du Pont book. It gives the properties of "Albone" . . . briefly describes its many uses in industry. And remember, whatever your use or intended use of hydrogen peroxide, feel free to call on Du Pont technical service.

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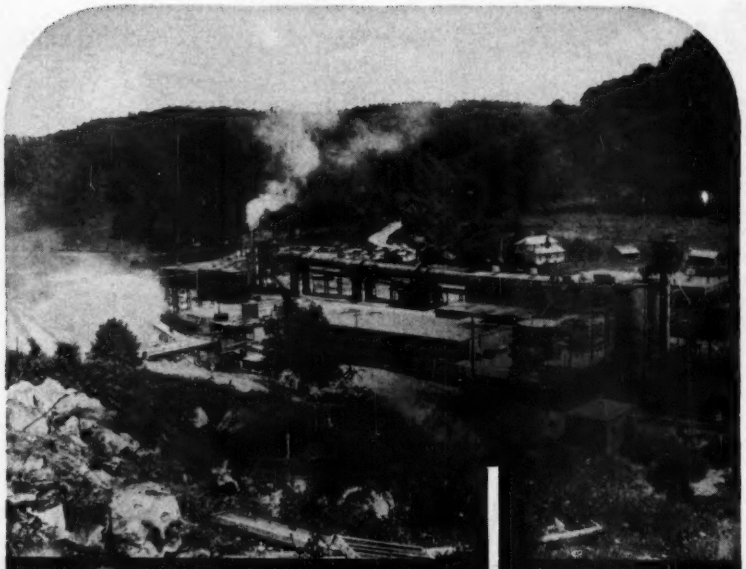

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With the realization that Sunbright is approaching full production, you can now plan ahead in terms of Foote lithium.

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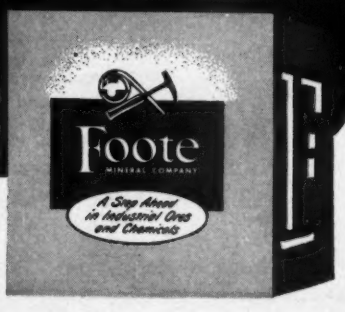

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OPINION . . . . . .

have started . . . but I'll bet it will be a long, long time before the lure of cheapness is overwhelmed . . .

That's going to mean some miserable experiences for the plastics industry . . . and, I suppose, for lots of consumers . . .

DONALD R. PEARCE
Washington, D. C.

DATES AHEAD . .

Salesmen's Assn. of American Chemical Industry, chemical sales clinic, Commodore hotel, New York, N. Y., Oct. 19-20.

Natl. Paint, Varnish and Lacquer Assn., annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., Oct. 26-28.

Assn. of Consulting Chemists and Chemical Engineers, annual meeting, Belmont Plaza hotel, New York, N. Y., Oct. 27.

Society of Rheology, annual meeting, New Yorker hotel, New York, N.Y., Oct. 29-31.

American Oil Chemists Society, fall meeting, Sherman hotel, Chicago, Ill., Nov. 2-4.

American Council of Commercial Laboratories, annual meeting, Sheraton-Cadillac hotel, Detroit, Mich., Nov. 4-7.

American Petroleum Inst., annual meeting, Conrad Hilton hotel and Palmer House, Chicago, Ill., Nov. 9-12.

Chemical Institute of Canada, 5th Canadian high polymer forum, London Library and Museum, London, Ont., Nov. 19-20.

Manufacturing Chemists Assn., midyear meeting, Waldorf-Astoria hotel, New York, N.Y., Nov. 24.

Chemicals Industries Exposition, Commercial Museum and Convention Hall, Philadelphia, Pa., Nov. 30-Dec. 6.

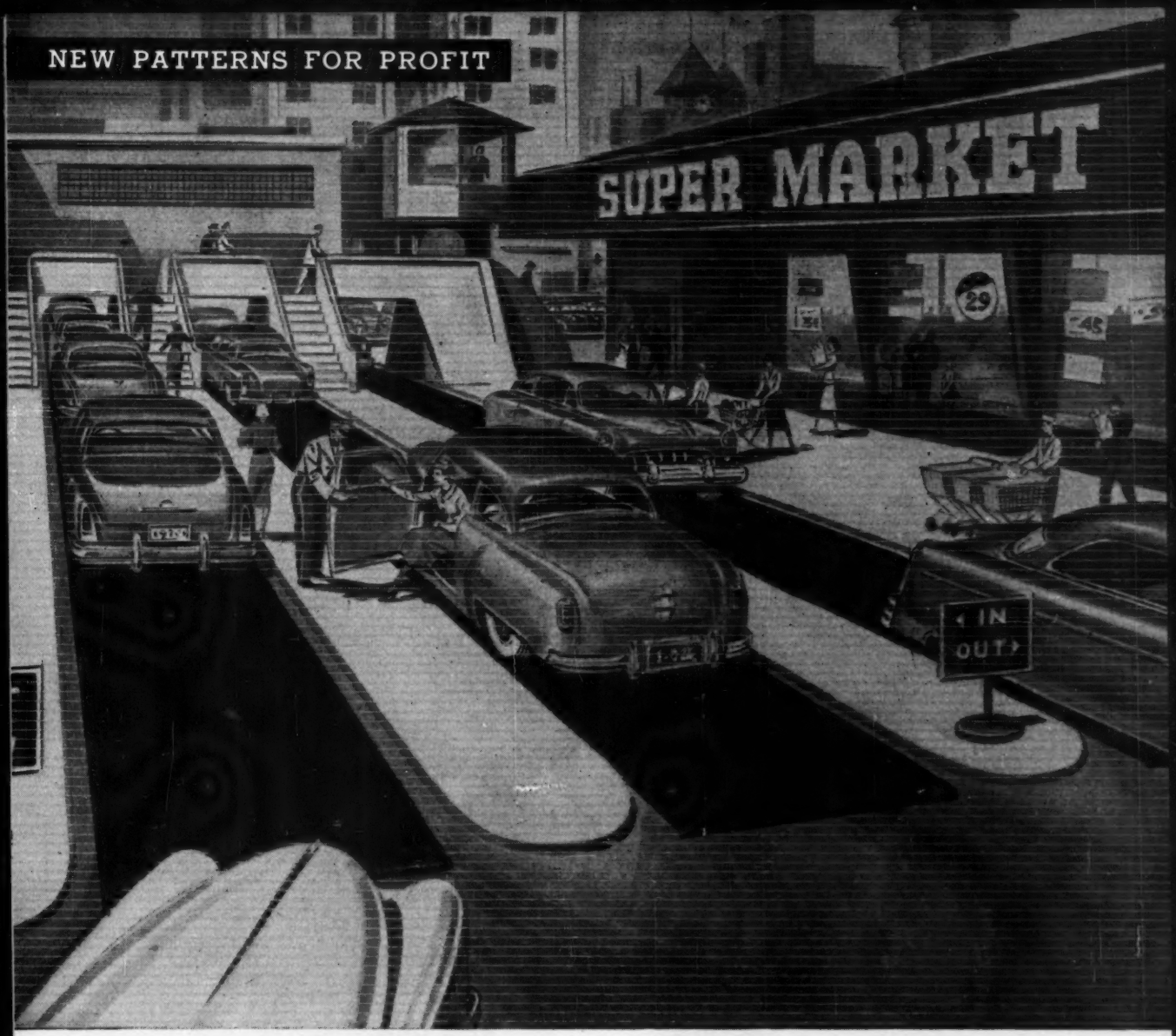
Chemical Specialties Manufacturers Assn., annual meeting, Mayflower hotel, Washington, D.C., Dec. 6-8.

American Chemical Society, regional meeting, Jung hotel, New Orleans, La., Dec. 10-12.

American Institute of Chemical Engineers, annual meeting, Jefferson hotel, St. Louis, Mo., Dec. 13-16.

Assn. of American Soap and Glycerine Producers, annual meeting, Waldorf-Astoria hotel, New York, N.Y., Jan. 26-28.

Drug, Chemical and Allied Trades section of the N.Y. Board of Trade, annual dinner, Waldorf-Astoria hotel, New York, N.Y., Mar. 4.



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Heavy-duty belting . . . tougher, more wear-resistant than any flexible material yet developed is now available . . . waiting for clever engineers to design entrance-to-parking-lot conveyors or "moving sidewalks" for people. Startlingly new conveyor systems for raw materials, industrial parts, or suburban shoppers can now be made.

Monsanto customers produce these tough, rubber-like elastomers by copolymerizing styrene monomer or acrylonitrile and butadiene. These chemical rubbers are oil-resistant, weather-resistant, and incredibly tough. They can be molded into longer-wearing shoe heels, stamped from heavy sheets into shoe soles, combined with cord or fabric to make power transmission and conveyor belts that outlast any other belting yet developed.

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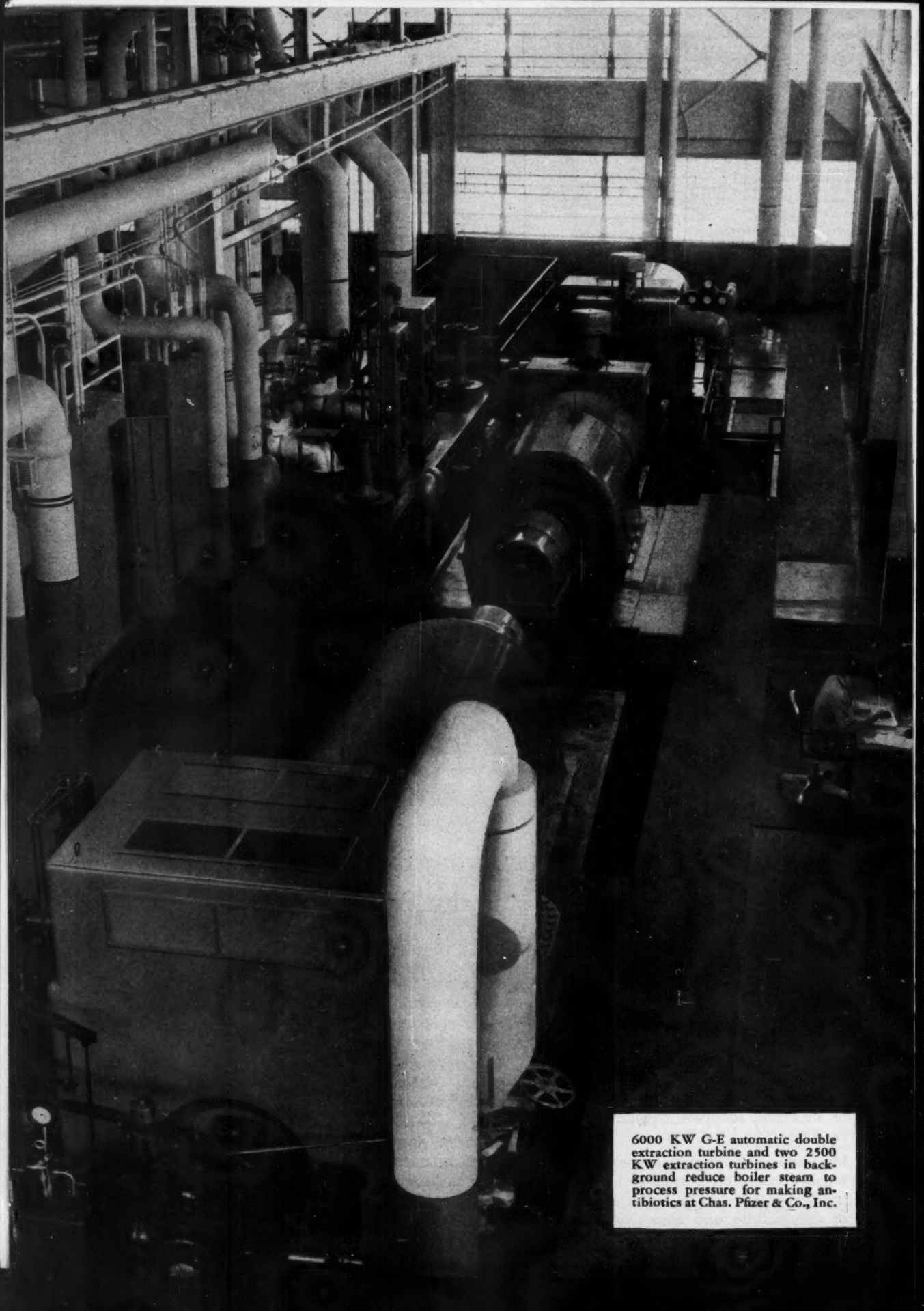

6000 KW G-E automatic double extraction turbine and two 2500 KW extraction turbines in background reduce boiler steam to process pressure for making antibiotics at Chas. Pfizer & Co., Inc.

G-E Extraction Turbine at Chas. Pfizer & Co., Inc. Increases Plant Thermal Efficiency Over 15%

Extraction pressures held constant, even under varying loads; turbines reduce boiler steam to process pressures for use in making antibiotics

Plant thermal efficiency was increased over 15% when Chas. Pfizer & Co., Inc., producer of antibiotics, recently installed the third General Electric automatic extraction turbine-generator at its Groton, Connecticut, plant. A 6000 KW extraction unit was installed to take fullest advantage of available high-pressure steam, and to obtain additional economical by-product power.

PRESSURE HELD CONSTANT

The double automatic extraction turbine takes steam at 725 F, 600 psig, and extracts at 135 and at 50 psig for plant process uses in the making of terramycin and other antibiotics. Chas. Pfizer & Co., Inc. reports that accurate turbine governing holds electrical frequency constant, and keeps extraction pressures precise, even when the quantity of extracted steam varies. (See charts below.)

If your plant uses process steam, why not take advantage of G.E.'s experienced turbine engineering resources. G-E engineers will study and recommend ways for you to best utilize steam supply. Get more for your turbine dollar with G-E turbine-generators. General Electric Company, Schenectady 5, New York. 256-8

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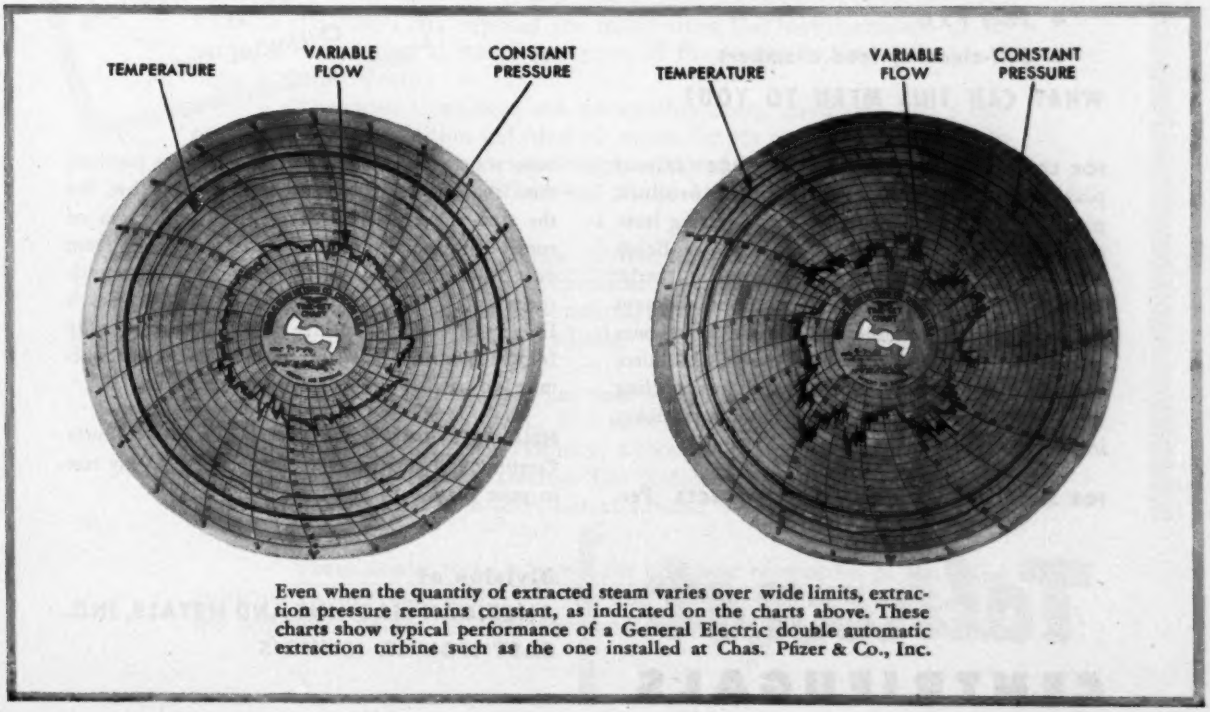

Even when the quantity of extracted steam varies over wide limits, extraction pressure remains constant, as indicated on the charts above. These charts show typical performance of a General Electric double automatic extraction turbine such as the one installed at Chas. Pfizer & Co., Inc.

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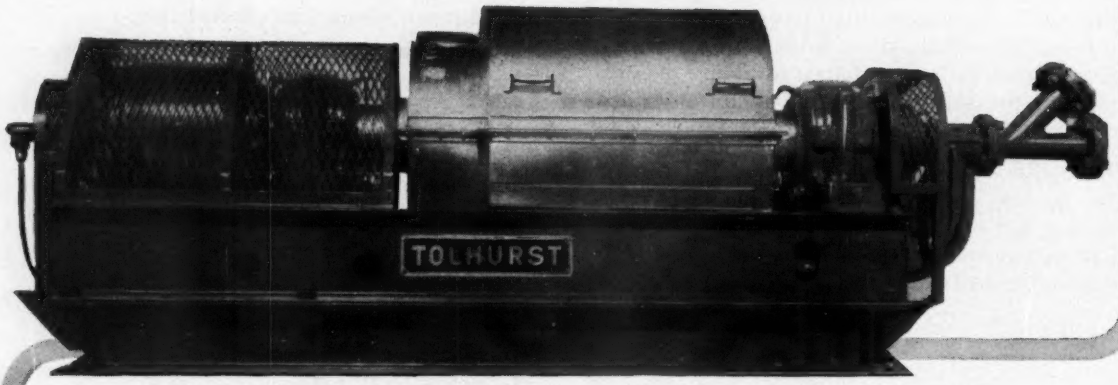
cut filtration costs for you?



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FOR LONG RUNS ON A SINGLE PRODUCT If your plant runs continuously on a single product, process fluctuations or changes in processing technique need no longer be a problem. The Vari-Beach Drive permits beach speed to be changed instantly, from 0 to 300 inches per minute. Seven different pool depths are available by a simple adjustment of the Vari-Pool Orifice Plates. An available force of 2000 times gravity assures maximum settling rate. This flexibility can mean maximum efficiency in your centrifuging step.

FOR SHORT RUNS ON DIFFERENT PRODUCTS Perhaps your plant runs for awhile on one product, then changes over to another product. Now, for the first time, you can enjoy the advantages of continuous centrifuging. When you change from one product to another, you simply adjust beach speed and pool depth by means of the Vari-Beach Drive and Vari-Pool Orifice Plates and you're ready for the new run. Self-cleaning feed chambers minimize down time when changing products.

FIELD TEST UNITS Ask for details on Tolhurst Continuous Centrifugal available for a 90-day test in your plant.

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Chemical Week
BUSINESS MAGAZINE OF THE CHEMICAL PROCESS INDUSTRIES

NEWSLETTER

Agreements—in all stages of negotiations—are in the news:

• Army Chemical Corps is informally negotiating with Mathieson Chemical for a contract "covering certain aspects of the Corps' operations"—purportedly the Camp Detrick, Md., laboratory, which since World War II has been a bacteriological warfare development center. What's likely behind the move: Defense Secretary Wilson's attitude that, all other factors being equal, "a government agency should not be . . . competing with private industry."

• Monsanto Chemical and National Research Corp. are dickering with Defense Materials Procurement Agency for a government loan to finance a titanium metal plant. The two firms have been engaged for some months on a joint research project.

• Atomic Energy Commission has okayed a one-year agreement with Duquesne Light Co., Pittsburgh, and Walter Kidde Nuclear Laboratories, Garden City, L.I., governing a nuclear power reactor survey to be undertaken by the two firms, which will bear all the costs.

• Monsanto decided not to take up its option to lease the Army's caustic-chlorine plant at Muscle Shoals, Ala., which was completed in June of last year but was never operated (except for test purposes). It's designed to turn out 225 tons/day of chlorine, but the Army says it can operate "with reasonable efficiency" at a much lower output. Sealed bids will be solicited soon, will be opened Dec. 18.

•

Two companies this week relievedly got off a "hot seat" in their relations with local plant communities:

The 3,000 residents of Belle, W. Va., will have to wait another three years before they again attempt to incorporate Du Pont's property into the city. Du Pont opposed the move since the high valuation of its property meant that it would pay most of the taxes, receive correspondingly little in benefits.

American Cyanamid got permission from Savannah, Ga.'s city council to draw 6 million gal./day of water for its proposed titanium dioxide plant. The proposal was strongly opposed by Union Bag & Paper, which asserted that the withdrawal would lower the water table.

•

Batting back and forth in Washington is a proposal that, if enacted, would furrow many a chemical executive's brow. It's the long-touted national sales tax at the manufacturers' level, under which manufacturers will have to determine whether each item sold is an intermediate or an end-product.

President Eisenhower has said such a tax was under consideration, and Rep. Noah Mason (R., Ill.) says he'll introduce a bill for an 8% manufacturers' sales tax in January, although he doesn't expect it to be passed during this coming session. The National Assn. of Manufacturers favors the same kind of a levy, but at around 5%.

•

There seems to be a moral for chemical companies in the latest antitrust rulings (see p. 32): if you find yourself holding a big share of the important patents on processes and equipment for any product, play

safe and license those patents before the antitrusters spring to the attack.

What happened to General Electric in the light-bulb case—described by the government as a "logical development" from the decisions in the glass machinery case in 1945, the titanium pigments case in 1947, and the aluminum case in 1950—was wholesale divestiture of exclusive patent rights.

For industries based on patented inventions and techniques, this antitrust development may bring about sweeping changes in business patterns, such as those induced by the 1911 decision against Standard Oil and other trust-busting landmarks.

•

Add another "for-example" to chemical companies' trend toward turning out consumer products. Next month Dow Chemical will start beaming television ads to the American housewife promoting its household food packaging material, Saran-Wrap. It will also be advertised in newspapers, magazines, and grocery trade organs.

National distribution is now being readied after a test-market campaign in Midwest areas.

•

Still under consideration is national distribution of another chemical firm's consumer product. Harshaw Chemical is now test-marketing in Columbus—soon in Cincinnati and Dayton too—a laundry additive that is claimed to make clothes softer and fluffier, cut ironing time, reduce wrinkles and eliminate static electricity. A 16-oz. bottle, enough for 16 wash loads, sells for 40¢.

Harshaw has set up a manufacturing and distributing subsidiary, Laurel Products, Inc., to handle the new item.

•

The Air Force is worried about titanium—so worried, in fact, that a Senate subcommittee got producers, fabricators, government and military representatives together for a hearing. It came out that:

- Estimated production this year (3,047 tons) will fall short of requirements (3,500 tons).
- The gap will progressively widen, so that 1955 output will hit 13,400 tons while requirements are 19,000 tons.
- Air Force needs alone by 1956 will be 35,000 tons.

Blueprints for new planes are now held up because designers don't know how much titanium they can count on a few years hence.

•

Federal research expenditures will drop in fiscal 1954. Expenditures are expected to fall from this year's $2,205 million to $2,187 million. A further drop (to about $2,074 million) can be predicted for 1955 on the basis of today's thinking.

•

Canadian newspapers are full of a rumor that the Canadian government may, following the U.S.'s example, sell its synthetic rubber facilities—Polymer Corp., at Sarnia, Ont.—to private interests.

If such a sale is made, it is expected that the government would insist on terms similar to those it made in selling a jet engine plant recently: the buyer must make jet engines for 10 years.

Fixed assets of the corporation, the only completely integrated facility in North America, are estimated at $70 million.

. . . The Editors

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you asked for facts on Hydrazine...

Hydrazine is now available in several forms and in a number of derivatives. As an exceptionally effective reducing agent, oxygen scavenger and nitrogen "building block," hydrazine has many uses. The salt derivatives make available the properties of the basic chemical. These forms may be more suitable where the process requires modified solubility or controlled reaction. The salt derivatives may also be preferred where longer storage or less careful handling is involved. A typical aliphatic derivative is beta-hydroxyethylhydrazine. It has specific uses and is particularly interesting as an intermediate for combinations including ethylene or ethanolic groups.

The following hydrazine products are available in commercial quantities for full-scale industrial application.

NAME	FORMULA	PROPERTIES
anhydrous hydrazine (95%) tech. grade	N_2H_4	Colorless, mobile liquid, 8.38 lbs./gal. at 25°C., melting point 2°C., boiling point 113.5°C., completely miscible in water and methanol, flash and fire point 126°F. (open cup).
hydrazine hydrate 100% (64% N_2H_4) tech. grade	$N_2H_4 \cdot H_2O$	Colorless, mobile liquid, 8.61 lbs./gal. at 25°C., melting point –51.7°C., boiling point 120.1°C., completely miscible in water and methanol, flash point 163°F., fire point 166°F. (open cup).
hydrazine hydrate 85% (54.4% N_2H_4) tech. grade	$N_2H_4 \cdot H_2O$	Colorless, mobile liquid, 8.59 lbs./gal. at 25°C., melting point –57°C., boiling point 119.8°C., completely miscible in water and methanol, flash point 193°F., fire point 204°F. (open cup).
dihydrazine sulfate (95% $(N_2H_4)_2 \cdot H_2SO_4$) tech. grade	$(N_2H_4)_2 \cdot H_2SO_4$	White crystalline flake, 55 lbs./cu. ft., melting point 104°C. approx., decomposes at about 180°C., soluble at 25°C. 202 gms./100 gms. water, relatively insoluble in most organic solvents.
hydrazine monohydrochloride (95% $N_2H_4 \cdot HCl$) tech. grade	$N_2H_4 \cdot HCl$	White crystalline flake, 57 lbs./cu. ft. approx. melting point 87° to 92°C., decomposes at about 240°C., soluble at 20°C. 37 gms. /100 gms. water, somewhat soluble in lower alcohols, insoluble in most organic solvents.
hydrazine monohydrobromide (95% $N_2H_4 \cdot HBr$) tech. grade	$N_2H_4 \cdot HBr$	White crystalline flake, 62 lbs./cu. ft. approx., melting point 81° to 87°C., decomposes at about 190°C., soluble in water and lower alcohols, insoluble in most organic solvents.
beta-hydroxyethyl-hydrazine (70% B-HEH) tech. grade	$HOCH_2CH_2 NHNH_2$	Colorless, slightly viscous liquid, 9.26 lbs./gal., 1.11 gms./cc. at 20°C., melting point –70°C., boiling range 145° to 153°C. (25mm. Hg.), flash point 224°F., completely miscible with water, soluble in lower alcohols, slightly soluble in ether.

In addition to the above commercial chemicals, the following derivatives are available in research quantities:

salicylalazine
furfuralazine
cinnamalazine
benzalazine
copper dihydrazine sulfate
stearic hydrazide
carbohydrazide
thiosemicarbazide
semicarbazide
monohydrazine sulfate
hydrazine oxalate
dihydrazine phosphate
hydrazodicarbonamide (biurea)
hydrazinocarboxylic acid (carbazinic acid)

Further information or samples can be supplied. To avoid delay, please request samples on your company letterhead.

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1968

BUSINESS & INDUSTRY . . .

Shielding Subsidy

Furore over this nation's vulnerability to Russia's H-bombs and long-range bombers served as background for the government's disclosure that chemical and allied industries are practically the only ones that have made any progress in post-attack planning.

In a report that focused attention on U.S. industry's need for defense against bombing attacks and for means of recovering from such attacks, the Office of Defense Management stated:

"Leaders of chemical, rubber and photographic film industries have initiated studies and have developed preliminary proposals for solving their post-attack production problems."

Three to Get Ready: This report—the first one to be made by the Eisenhower administration on mobilization preparations—generated steam-clouds of speculation about the imminence of the danger, and the Soviets' ability to land devastating blows on U.S. industrial targets. Latest word from the President: "We conclude that the Soviets now have the capability of atomic attack on us, and such capacity will increase with the passage of time."

Thus the threat seems too real and too immense to be ignored, so ODM has revised its rapid-tax-amortization regulations to stimulate building of protective structures—bomb shelters, blast walls, and other shielding measures. For plants located in critical target areas (the 70 most industrialized cities), companies are allowed 100% fast tax write-off on such projects, providing that construction cost is at least $25,000 and engineering is in accordance with government specifications. ODM estimates that built-in bomb resistance costs about 20% more than ordinary construction, can reduce plant damage by about a third.

Sabotage Considered: The chemical industry took the lead in post-attack planning by setting up a high-level, 11-man committee within the Manufacturing Chemists' Assn. (*CW, Mar. 14*). Since then, this task force has met three times, drafted a preliminary report that will be released later this month by the Business & Defense Services Administration's Chemical Division.

This report will cover problems that would arise at individual chemical plants under enemy attack, and damage resulting from internal sabotage and accidents. It will touch on:

- Preventive measures—dispersion of essential new facilities, decentralization of industry, protective construction.
- Logistics measures—preplanned production transfers from damaged to undamaged plants, reserve stocks, governmental emergency controls.
- Reconstruction measures—advanced planning on engineering, construction and equipment.

Previous attempts to work out rapid rehabilitation plans for bomb-hit plants have never been very productive, but the H-bomb threat may make a difference. One company, Cincinnati Milling Machine Co., already has qualified for a 100% fast write-off on its protective construction project costing $600,000.

FEDERAL RESERVE'S ROUNDS: No direct tie to chemical industries.

Sellers in a Hurry

Starting to sprint over a 13-month obstacle course designed for a dead run all the way are members of the commission whose job will be to peddle to private industry the government's 25 synthetic rubber plants.

President Eisenhower named two of the commissioners last week, and the third appointment was expected to be announced this week. In keeping with Congress' stipulation that members of this commission have no direct connection with the chemical, petroleum or rubber industries, Eisenhower started out by choosing a commodity dealer and a banker: Everett R. Cook, president of Cook & Co., Memphis, cotton merchants and exporters; and Leslie R. Rounds, first vice-president, Federal Reserve Bank of New York.

The commission has to get under way in a hurry. By law, it's required to begin receiving bids on Dec. 1; and starting next June 1, it will have just seven months to negotiate sales on the basis of bids received. Each bid will have to be cleared by the Dept. of Justice, and the whole plan of disposal will have to be passed on by the Congress.

Shifty Defense

Laying on the line its opposition to piecemeal collective bargaining, the chemical industry last week made clear that it wants no truck with the proposal to permit a plant force to be carved up into many small units represented by craft unions.

That proposal, urged by the International Assn. of Machinists and other AFL craft unions at the National Labor Relations Board hearing in Washington, was attacked by the Manufacturing Chemists' Assn., American Potash & Chemical, and the United Gas, Coke & Chemical Workers (CIO), supported by the National Assn. of Manufacturers, the Chamber of Commerce of the U.S., and the American Paper & Pulp Assn.

Running counter to its AFL sister unions, the International Chemical Workers Union will submit a brief strongly opposing craft severance. This contrary position may result in temporary estrangement or eventual ouster, but ICWU is adamant. "We were chartered as an industrial-type union." ICWU counsel Louis S. Belkin told CW, "and we construe that as recognition by the AFL that the chemical industry does not lend itself to bargaining by crafts."

Absent but Accounted For: Also aligned with the chemical industry on this principle are John L. Lewis, his United Mine Workers, and its catch-all District 50, which is the union

representing all AmPot hourly paid employees at Trona, Calif., except the ones splintered off by the IAM. Although directly concerned in this case, UMW boycotted the hearing because Lewis, still fuming at the Taft-Hartley Act, refuses to do business with the NLRB.

Industry spokesmen, in asking NLRB to treat the chemical industry as it has the steel industry and others usually organized on a plant-wide basis, argued that the highly integrated nature of production and maintenance work at chemical plants makes bargaining with many craft unions impractical. It would, they contended, disrupt otherwise stable labor relations.

By way of example, W. F. Spaulding, attorney for American Potash, told NLRB that the IAM had instigated half a dozen jurisdictional disputes since it came into the Trona plant last year. He asked the board not only to turn down the AFL request for additional separate bargaining units there, but also to order the IAM to relinquish its Trona unit.

Tougher Stand Weighed: The craft-vs.-industrial-unionism issue is one of many NLRB policies being re-examined by the revamped NLRB under the new, Eisenhower-appointed chairman, Guy Farmer. The board is considering:

- Whether to block AFL craft unions from carving up small bargaining units in basic chemical plants that customarily bargain on a plant-wide basis with one union; and
- Whether to take a tougher stand against craft bargaining where it is permitted fairly liberally. The AFL, of course, is against any move in that direction.

Nub of Spaulding's plea: the dependence of chemical workers on one another in production processes, and the interchange that's necessary between various classifications, sections and departments. This, said Spaulding, would be restricted under craft bargaining.

While the one-union system is no doubt simpler for a company to deal with, industrial relations managers also recognize that a union is in a stronger bargaining position if it can speak for all the workers. The IAM, it's safe to assume, is aware of all the pro and con arguments, since it has been on both sides of this same issue in previous debates before NLRB. To some observers, it appeared that IAM wants labor policy to be formulated in tune with IAM's day-to-day, plant-by-plant organizing moves.

What the World Shipped in 1952 to the Soviet Bloc (excluding Red China)

Country Exporting	Product Shipped			
	Chemicals	Dyes	Medicinals	Fertilizers
	(in thousands of dollars)			
Austria	1,262	165	20	4,111
Belgium	1,658	303	328	5,715
Italy	940	169	10	0
Denmark	45	48	699	0
France	2,267	325	1,237	1,567
Great Britain	711	175	648	154
Germany (West)	3,825	2,131	1,715	0
Norway	56	0	25	0
Netherlands	6,971	0	1,290	0
Sweden	1,072	1,268	48	0
Switzerland	0	0	0	0
United States	0	0	25	0

Figures obtained from files of the Organization for European Economic Cooperation (OEEC).

Soviet Baits, Europe Bites

Flow of western European chemical exports (1) to the European satellite countries and (2) to Red China has been virtually reversed in the past few months. While exports to China have climbed swiftly in dollar value, the take by western European countries behind the Iron Curtain has been sagging. Foreign Operations Administrator Harold Stassen's report to Congress last week reflects U.S. official opinion—that the trend is likely to continue, with Red China on the receiving end of the bulk of western Europe's chemical exports to Communist nations.

Major chemical products Europe is shipping to China are dyes, fertilizers, sodium compounds, drugs and artificial yarns. Last year:

- France shipped $11,000's worth of penicillin, $716,000 of phosphatic slag to Red China.
- West Germany did business totaling $829,000—peddled $163,000's worth of sodium hydroxide, $31,000 of sodium carbonate, $471,000 in disinfectants and insecticides, and $164,000 in unspecified chemicals.
- Italy shipped $52,000 of double aluminum sodium florides, $1,264,000 of ammonium sulfate.
- Sweden sold $65,000 of inorganic chemicals, $73,000 of methyl alcohol, bromine and iodine, $535,000 in tar dyes, $720,000 in indigo.
- Great Britain did a land-office business, shipping $3,144,000 in sodium compounds, $241,000 in medicinals, $4,364,000 in other unspecified products.

Meanwhile, exports from western Europe to Russia and the European satellites have slumped. They added up to $731.3 million last year—to which chemicals contributed a considerable chunk (*see table*)—but are running at only a $586-million clip in 1953.

Tension's mounting: The question of trade with the Soviet empire is one of the most exposed nerves of U.S. foreign policy. Senator McCarthy (R., Wis.) has spearheaded a drive to ban all trade with Communist China and to toughen the embargo against the rest of the Soviet block. Abroad, political and business pressure on Allied governments to relax the free world embargo on strategic shipments to the East has been mounting ever since the Korean cease-fire. To make matters worse, the United States has lacked a clearly defined Administration policy on East-West trade.

In an attempt to lull the gathering storm, Stassen in a report to Congress last week made a stab at laying out a middle-of-the-road East-West trade policy. The report stressed that the over-all political, economic, and military strength of the free world alliance was more important than isolated trade deals with Communist nations that might help them militarily. It recognized that many U.S. allies are heavily dependent on foreign trade, can't afford to pass up markets and resources anywhere. Stassen repudiated unilateral U.S. attempts to throttle East-West trade. The only way to get any effective control at all over trade with the Soviet empire, he said, is through patient Allied cooperation.

On the other hand, Stassen scoffs at the idea that Western strategic controls are cutting Allied nations off from vast and profitable Eastern markets. Real reason behind the sharp postwar drop: the Kremlin's drive for an inbred Communist economic system.

Policy-wise, the U.S. will continue to seek Allied backing for curbs on sale of strategic materials to the Soviet bloc, but it plans to use a more flexible yardstick in judging just what's to be considered as "harmful trading." Example of what's to be expected: President Eisenhower decided to continue aid to Norway last month in the face of Norway's sale of 3,000 tons of aluminum behind the Iron Curtain, in clear violation of the law defining the operation of strategic trade controls. His reason: Norway's contribution to NATO outweighs the importance of its defection.

Red China is to be considered as a special case in point since the Administration thinks it desperately needs Western goods—strategic as well as nonstrategic—to carry out an industrial revolution. When Dictator Mao proves he's dropped his expansionist aims, the U.S. is willing to make concessions.

Over the Long Haul: It seems to Washington right now that there's no end in sight to the East-West tug of war over East-West trade. A prolonged truce will intensify friction at best; there'll be mounting pressure from all sides to get China's trade, and various Allied governments that have so far resisted political pressure to scrap strategic controls will find it tough to hold out in a climate of relative international stability.

STASSEN: Repudiates a complete throttle on East-West trade.

Another danger in prolonged enforcement of existing controls: step-up of smuggling.

Stassen's report for the first time raised a corner of the secrecy curtain that has blanketed this underground struggle. It described such cloak and dagger incidents as this:

• Last August a posse of Thai police waited in the dripping jungle on the Thailand-Laos frontier. An automobile churned towards them along the mud-mired road. The posse opened fire. The four occupants of the car surrendered. In the back of the car were two bazookas, a mortar, a Colt-Smith gun, seven grenades, two complete field transmitters and receiving sets—bound for Ho Chi Minh's Communist guerillas in Indochina.

And so the trade war goes on. The weapons on the one side are forged documents, bribery, razzle-dazzle shuttling of contraband cargoes from ship to ship and free port to free port. The weapons on the other are a complicated system of international import and export licensing, international agreements on endless lists of embargoed goods, international agreements on chartering and bunkering controls. Making them work is another thing; it will take tight allied cooperation, unremitting official vigilance.

Dobbin or Cadillacs?

Although sagging under the weight of the responsibility, management has started to get settled on a cool, collected approach to the problem of air pollution.

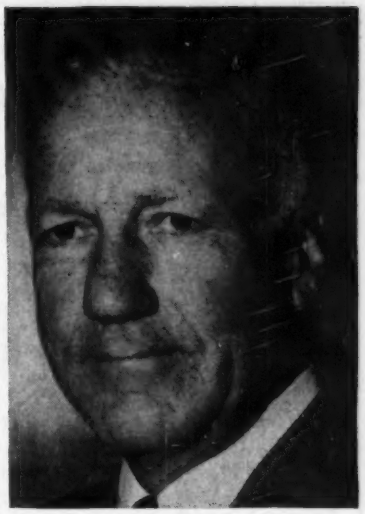
This week in Chicago, last week in Houston, and the week before in Los Angeles, leaders in science and industry got together, mapped out some of the paths to be taken, the quicksands to be avoided in moving in on that problem.

One point on which there was fervent agreement: research and development cut more ice than legislation.

As Pres. John Rettaliata of Illinois Institute of Technology told the Midwest Air Pollution Prevention Assn.: "It's a simple matter to pass legislation outlawing air pollution. It's a much more difficult task to actually stop objectionable and harmful air pollution without closing down industries."

Legislation and three other approaches* to the question were all branded as bootless by Executive Vice-

* "Demagoguery, hysteria, name-calling."



UNION OIL'S STEWART: What must be done, must be done willingly.

Pres. W. L. Stewart, Jr., of Union Oil Co. of California, in his speech on "Management's Responsibility in Air Pollution" at Houston's sixth annual industrial health conference. Management, summarized Stewart, "must continue to be a good community fellow; must maintain leadership in the fight to control air pollution; must continue to sponsor research; must improve our public relations, cooperate with the press—and we must do all of these voluntarily." Noting that some village aldermen had demanded that industry "turn back the clock" to older production methods as a means of reducing pollution, Stewart rhetorically wondered whether those aldermen "would prefer old Dobbin to their Fords and Cadillacs."

And at Los Angeles, where industries have spent an estimated $150 million on equipment to control and minimize stack fumes, the county medical association is plugging for a $5-million research program on the local species of smog—its causes, effects, and possible remedies.

COMPANIES. . . .

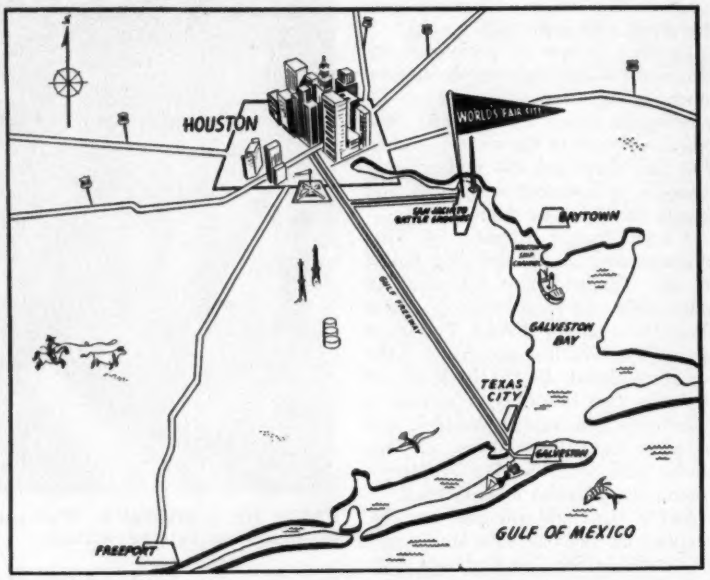
Latest DPA issued certificates of necessity include write-offs to:

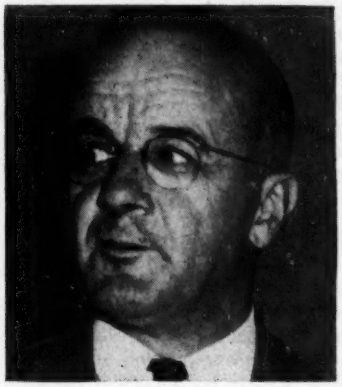
• Air Products, Inc., Emmaus, Pa., Walkerton, Ind., and Chicago, Ill., $30,400 at 45% for oxygen and acetylene.

• Pittsburgh Coke and Chemical Co., Neville Island, Pittsburgh, Pa., $2,260,000 at 75% for activated charcoal for military use.

•

Archer-Daniels-Midland Co. has sold its chlorophyll interests to a new





Top Billing for Chemicals

WITH CHEMICAL and petrochemical plants as neighbors,* the 1956 World's Fair at Houston, Tex., is planning to give top billing to these industries in its commercial and industrial exhibitions, which are expected to be maintained as permanent displays after the international exposition is over.

Noting that around $500 million was spent for new petrochemical construction in the Houston area last year, the World's Fair board of directors cite this judgment by an economics professor: "The industrial world of the next cycle is obviously to be dominated by vast new chemical industries . . . and Houston is the very living heart of this new world." Also, Walter W. Kemmerer (*above*), retiring as University of Houston president to become general manager of the World's Fair, points out that 1956 will be the 100th anniversary of the birth of modern chemistry through the molecular weight discoveries of Amadeo Avogadro and the work of William Henry Perkin in synthesizing the first coal-tar dye; and the 50th anniversary of Einstein's mass-energy equation and of Paul Ehrlich's pioneer work in antibacteria drugs.

Companies renting display space will be able to get financial details next month. In general, arrangements will be similar to those used in the New York World's Fair of 1939-40, with exhibitors making partial payments in advance and underwriting revenue bonds to pay for the fair's capital investments. So far, the board has acquired, at a cost of about $510,000, a 956-acre tract adjoining San Jacinto State Park, site of Gen. Sam Houston's 1836 victory over Mexican dictator Santa Anna.

* One-quarter mile from Rohm & Haas, Diamond Alkali, and Shell Chemical; two miles from Du Pont's La Porte plant.

corporation headed by Donald G. Carpenter, former manager of its chlorophyll division and president of Keystone Chemurgic Corp., Bethlehem, Pa. Involved in the transaction: A-D-M's plant and equipment at Bethlehem, rights to new processes developed within the past year both in the U.S. and under company direction at Munich, Germany.

Consensus is that U.S. consumption of chlorophyll this year will total less than 40,000 lbs.—a serious drop from production quotas of 100,000 lbs. in the summer of 1952. Archer-Daniels-Midland—with an estimated yearly production capacity of 40,000 lbs.—could virtually satisfy the demand all by itself.

•

United Dye & Chemical Corp. has extended until Nov. 30 its offer to stockholders of 7% preferred stock to accept $100 face amount of 6% debentures maturing in 1973 and one-fifth share of common stock for every preferred share outstanding.

EXPANSION . . .

Sodium Chlorate: Oldbury Electro-Chemical Co.'s sodium chlorate-phosphorus pentasulfide plant at Columbus, Miss. (*CW, July 18, '53*) will be in full swing by Apr. '54.

•

Aluminum: Reynolds Mining Corp., a wholly owned subsidiary of Reynolds Metals Co., has started work on its aluminum reserves in Haiti. Principal deposits, located at Port-au-Prince, are five miles from deep water, run over and along a plateau some 3,000 ft. above sea level. Cost: several million dollars; initial capacity: 750,000 tons/year.

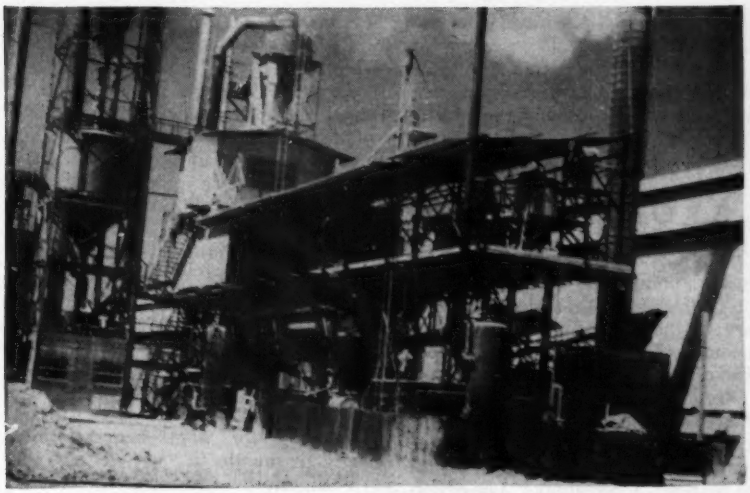
Reynolds has just completed another expansion program, bringing on-stream its new plant, adjacent to the Hurricane Creek, Ark., alumina works, to make activated alumina desiccant.

•

Dicalcium Phosphate: Texas City Chemicals, Inc.'s $7-million "three-purpose" plant in Houston, Tex., has been put into production, will get into high gear by December. Units involved: a sulfuric acid plant, feed and fertilizer-grade dicalcium phosphate units and a uranium plant.

Plans on the drawing boards are expected to mushroom the works into a $100-million enterprise some time in the not-too-distant future; but company officials, silenced by security regulations, can't reveal their next move.

Present dicalcium phosphate output: 70,000 tons/year, of which 55,000 tons reportedly will be feed-grade material, the balance slated for fertilizer uses. Sulfuric acid capacity: 300 tons (full-strength) daily.



SULFURIC ACID . . . first turned out by Fertilizers & Chemicals in 1949

A Giant Step Taken

Big steps in founding a fertilizer industry involve production of sulfuric acid, ammonia and nitric acid. So in bringing its Haifa, Israel, sulfuric acid plant onstream this week, Fertilizers & Chemicals, Ltd. takes its biggest stride toward that goal, and sees a clear path to establishing ammonia and nitric facilities.

The hope: to turn out enough fertilizer, in various forms, to provide food for Israel's entire population—now over 1.5 million. The cost: over £14 million, say company executives. Financial backers include the Israel government, the Export-Import Bank, various private investors.

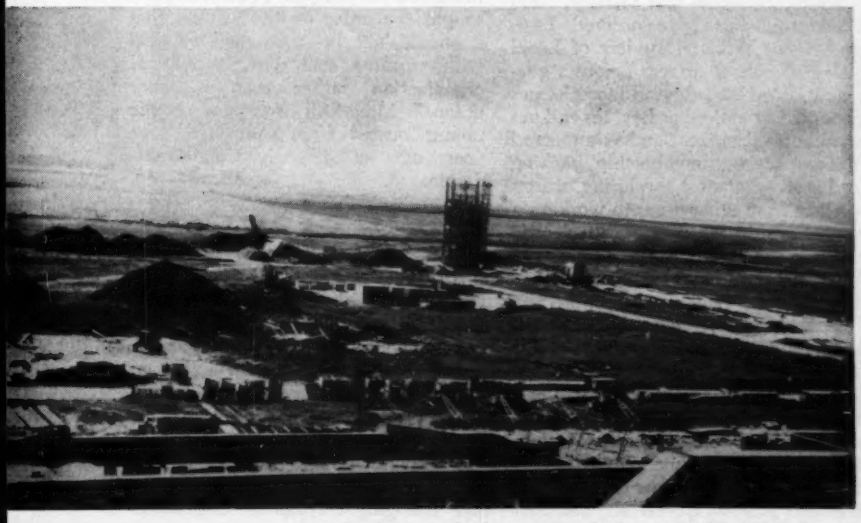
First planned as a potash upgrading company in 1946, F&C barely got into production before outbreak of the Israel-Arab war. Cut off from its source of supply (potash from Palestine Potash, Ltd.) and holding a newly delivered sulfuric acid unit (intended for potassium sulfate manufacture), company officials recast the schedule, decided to go into superphosphate production instead.

Then Israel's whole agricultural pattern changed suddenly. The need for superphosphates jumped from 15,000 tons in 1947 to an estimated 100,000 tons this year. F&C's 2,000 tons/month output couldn't begin to meet the demand; imports—largely from Belgium and Holland—soared.

Determined to stay in the forefront of the Israel fertilizer industry, F&C contracted to have Chemical Construction Co., New York, design, supply and erect an ammonia and another sulfuric acid unit, and aid in fertilizer plant construction; called upon the Société Belge de l'Azote et des Produits Chimiques, Marly, to help build nitric acid facilities. A working barter agreement with Turkey for pyrites (whereby F&C receives pyrites in return for a specific amount of sulfuric acid produced) was negotiated. Rock phosphate deposits were discovered in the Negev desert.

When completed, the picture should look something like this:

- Ammonia production will come close to 45 tons/day, will be based on refinery gas, piped directly to the plant site (outside Haifa). Cost, £3.3 million; estimated date of completion, mid-1954.
- Sulfuric acid output, just starting up, is aimed at a 270 ton/day goal, dangles a £2.69 million price tag. At present Turkish pyrites are being trucked in, but rail connections from the harbor should soon ease any supply problems.
- Superphosphate production is already bustling along at a 3,000 ton/month clip, will pick up over 50% when additional sulfuric acid supplies begin to roll in.
- An ammonium sulfate plant, still in design stages, is planned to turn out up to 50,000 tons/year at a cost of £216,000.
- Nitric acid production hangs on the completion of ammonia facilities, is initially scheduled for 45 tons/day of acid—partly for conversion to



. . . has become the base upon which a centralized industry is growing up in Israel today.

concentrated nitric (for sale locally), partly for reaction with ammonia to form ammonium nitrate. Both industrial and fertilizer grades of ammonium nitrate will be produced.

Additional units planned: a potassium sulfate plant (output 12,000 tons/year), dicalcium phosphate (output 10,000 tons/year), and a triple superphosphate works when phosphoric acid becomes available.

The first two are pegged as export items by F&C top planners, who say they're determined to become the largest chemical outfit in Israel.

Think of the Man

Supervisors who concentrate on "employee-centered leadership" usually get more output from workers than do foremen whose supervising efforts are "production-centered."

This is the finding of Rensis Likert, University of Michigan social research director, as expounded during last week's personnel conference of the American Management Assn. at New York's Hotel Statler. In discussing with other personnel directors and researchers the problem of "Motivating Employees to Do a Fair Day's Work," Likert contended that high productivity stems from supervisory practices that now are little used by management.

Overrated as productivity motivations, says Likert, are:

- Financial incentives in the form of piece rates.
- Rewards in the form of employee benefit and recreational programs.
- The work itself (in the case of routine jobs).

Instead, Likert recommends:

- Supervision that's not too close, with greater authority and freedom of action for supervisors and more responsibility delegated to their workers.
- Supervisors who'll stick up for their workers, be less punitive when a man makes a mistake, spend more time giving workers individual training.
- Supervisors who encourage the workers to take part in making decisions on work methods and job standards.

Application of these principles, Likert states on the basis of studies he guided at a variety of organizations, gives the same results, regardless of the company or industry.

More significant to the chemical industry was the description of Dow Chemical Co.'s many-sided training program for employees, presented jointly by Dow's Chester Payne and Ralph Smith.

Their conclusions: training, to be most effective, must be a function of line supervision; training should be devised to develop specific skills required to do specific jobs.

LABOR

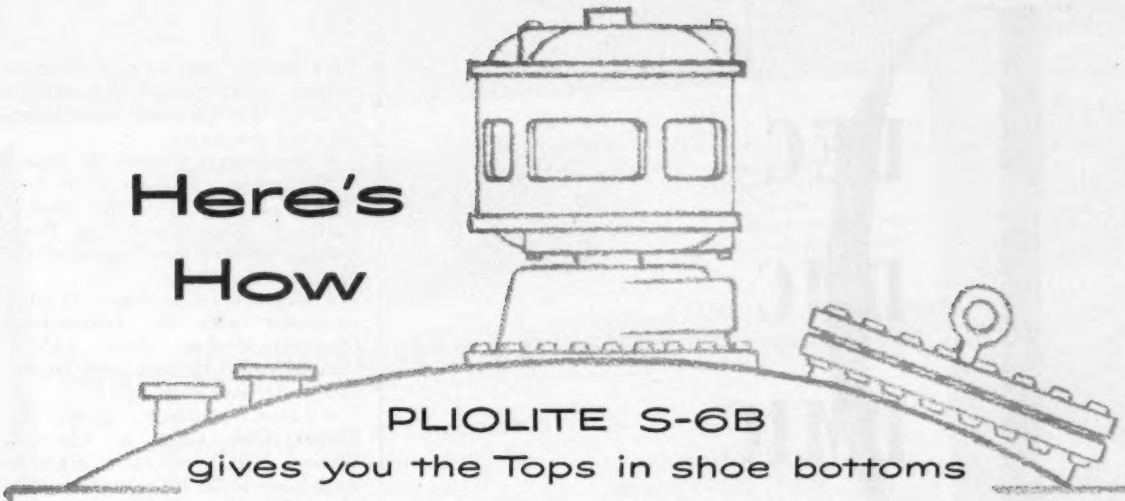
Unions Zero In: While some labor unions' doings the past two weeks have affected or threatened the welfare of the whole nation in general, union activities, in other instances, bore directly on the chemical industry.

- Along the Atlantic and Gulf coasts, all companies concerned with ocean and coastal shipping were nervously watching each move of the 50-year-old International Longshoremen's Assn. and the new union being organized by the AFL to put the graft-ridden ILA out of business. An injunction asked by the President under the Taft-Hartley law got the longshoremen to end their strike for the time being, but the struggle between the rival unions is just beginning.
- Another threat to transportation is the action of the railroad brotherhoods in demanding substantial wage increases—a flat 30% by the locomotive engineers, a straight 37½¢/hour by the other "operating" brotherhoods.
- While the whole AFL was striving to cope with the waterfront situation, one AFL union—the International Assn. of Iron Workers—had its hands full trying to deal with an uprising that has affected the new chemical center at Calvert, Ky., as well as the atomic energy plant at Paducah and other industries in that vicinity. Iron Worker officials have ordered Business Agent William Sanders of Local 595, Paducah, to appear before a governing board Oct. 24 and face charges of violating union orders to end an unauthorized strike. Sanders appeared to have strong membership backing for his stand against the hiring of iron workers from other areas to work on a project within his district, an electric power plant at Joppa, Ill., (across the Ohio from Paducah) to supply the AEC plant.
- Another firecracker that seems to be arching into the industrial relations powder keg at Paducah is the announcement by the AFL Machinists of plans for intensive organizing at atomic energy plants there. Production and maintenance employees at the Paducah plants, operated by Carbide and Carbon Chemicals, are now represented by the Gas, Coke & Chemical Workers (CIO). The Machinists' move would be termed "raiding" in labor union parlance, even though the employees would choose in a secret-ballot election whichever union they wanted. The AFL and CIO are working on a "no-raiding" pact, but actions like the one proposed by the Machinists might kill adoption of that pact.
- At the government-owned TNT plant operated by Atlas Powder near Chattanooga, plant guards went on strike and set up picket lines that were honored by production and maintenance workers. The guards, members of United Plant Guard Workers of America, have been negotiating for wage increases for nearly six months.
- Kingsford Chemical Co. has closed its plant at Iron Mountain, Mich., "until law and order have been restored," according to President Owen Pyle. The strike by Local 952, United Auto Workers (CIO), began on July 1, but by mid-August Pyle claimed that enough men were back on the job to permit production at 50% of the normal rate (*CW, Aug. 29*). Since then, however, friction between strikers and nonstrikers has produced almost daily violence and vandalism; and Pyle has accused city, county and state authorities of failing to protect the company and its workers.
- Pickets have been withdrawn in accordance with a unique court order, but the International Union of Mine, Mill & Smelter Workers (Ind.) continues to wage its eight-week strike against Precision Scientific Co., Chicago. Union attorneys said they would fight the injunction, said to be without precedent in Illinois. The company sought the order on the ground that it should not be compelled to deal with a group that was "a political organization rather than a labor union." Mine-Mill was one of the unions ousted from the CIO three years ago as allegedly Communist-dominated.

•

Company Spanked: A trial examiner for the National Labor Relations Board has ruled in favor of the AFL Operating Engineers and against the Kibler-Camp Phosphate Enterprises of Dunnellon, Fla. He ruled that the company should enter into collective bargaining with the union locals, rehire an employee who assertedly had been fired because of his union activities, stop discouraging membership in the union, and consult the union before changing employees' wages and hours.

Here's How



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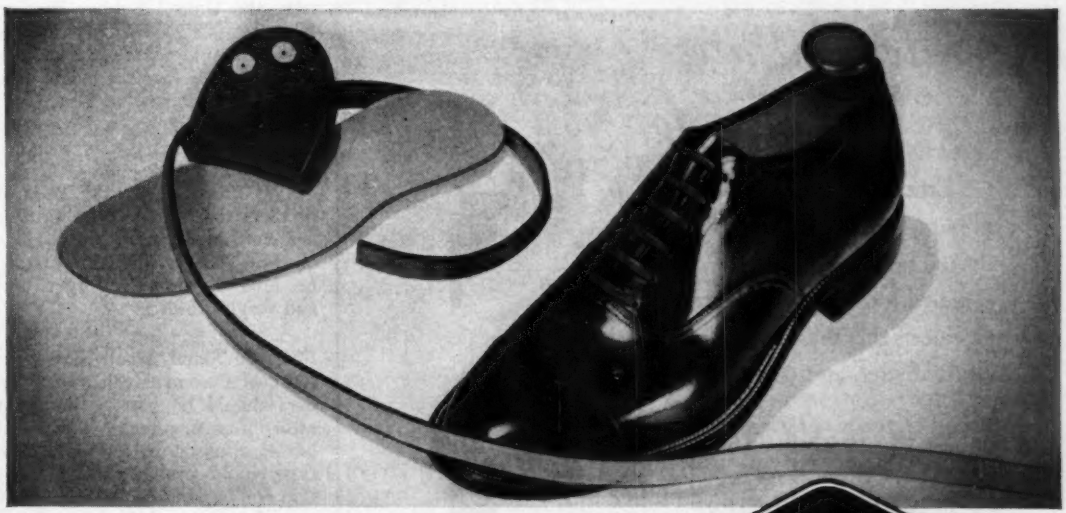

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Up a Jitney: Chemical wage increases continue to fall chiefly within the 5 to 8¢ range that has been almost standard since last spring.

- Members of District 50, United Mine Workers, struck for a 10¢/hour increase at the paint division plant of Pittsburgh Plate Glass, East Point, Ga., but within a month accepted the company's 5¢ offer.
- Norton Co. has renewed its labor agreement with the International Chemical Workers Union (AFL), granting one additional paid holiday and an 8¢/hour wage rise.
- Latest contracts signed by United Gas, Coke & Chemical Workers (CIO) call for a 10¢/hour wage boost at the Interchemical Corp. plant, Hawthorne, N.J.; a 6¢ across-the-board increase at Glascote Products, Cleveland; 16¢ worth of new benefits at the Mathieson plant, and a 7¼¢ package at the Virginia-Carolina plant, both in Little Rock, Ark.; and wage hikes of up to 10¢/hour at four drug and cosmetic plants in the New York area.

•

No Medical Worries: Having negotiated 5¢ wage increases and 7¢ in other benefits in its 1953-54 contracts with the "Big Four" rubber companies, the United Rubber Workers of America (CIO) will now try to extend to employees of some 275 other companies the company-paid hospital and surgical coverage now provided for about 110,000 employees of the Big Four—Firestone, Goodrich, Goodyear, U. S. Rubber—and General Tire. URW President L. S. Buckmaster predicts that when these agreements are concluded, "probably by summer of 1954," nearly 750,000 persons will be able to virtually forget hospital and surgical bills.

•

Foremen Stand Aloof: The National Assn. of Foremen feels that its members should be part of management rather than members of labor unions, but is opposed to federal legislation that would prohibit union membership for foremen. "To protect a foreman from organized labor by law," said one official at the association's recent convention in Milwaukee, "is a restriction of his individual freedom."

•

Labor and the Law: Industrial relations directors are having to pay more and more attention these days to the way labor unions are affected by laws and by court decisions:

- Some 40 AFL Machinists employed at Texaco's asphalt plant and terminal at Port Neches and Port Arthur, Texas, were upheld by a state appeals

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court in their claim that they were eligible for unemployment compensation during a strike by CIO Oil Workers at the company's Port Arthur refinery. The court ruled that a non-striking worker who is prevented from working because of fear of violence from pickets is "justifiably unemployed."

•

Jurisdiction Reversal: The CIO Oil Workers' interest in the chemical industry as a fruitful field for organizing efforts is in the news again this week following a new jurisdiction assignment in Canada. After first ruling that two big plants at Edmonton, Alberta, were in the chemical domain of District 50, United Mine Workers, the Canadian Congress of Labor now is supporting the OWIU as the union to try to organize employees at Edmonton. The plants, owned by Canadian Industries Ltd. and Canadian Chemical Co., were reassigned on the ground that they are "purely petrochemical."

Just Warming Up

Checking the batting averages of the various sectors of Austria's fertilizer industry today would be a well-advised move for world marketers. Production's booming, home consumption requirements have been passed, expansion plans are being postulated with an eye to even greener pastures. What's the next pitch? A drive on world demands.

The Economic Cooperation Administration's latest roundup on fertilizer in Austria paints a bright picture. Broken down, here's the Austrian outlook—aimed at "closing the gap in world-wide supplies."

Production of calcium ammonium nitrate—sparked by the Austrian Nitrogen Works—stands at 432,603 metric tons annually; Austrian requirements are estimated at an optimum of 160-170 metric tons/year. The difference is earmarked for export—chiefly to the United States, Poland, France, Egypt.

Surplus ammonium sulfate production goes chiefly to the Union of South Africa—1,400 metric tons in 1952. Great Britain, in 1952, took 696 metric tons; Cyprus, 200 metric tons.

Heavy production of superphosphates (an estimated 62,000 metric tons) is just around the corner, and though tonnage is slated entirely for domestic use at first, facilities can be quickly expanded to include exports.

By 1954, Austria's position in the world fertilizer lineup should loom even bigger. And that's when the real fracas will begin.

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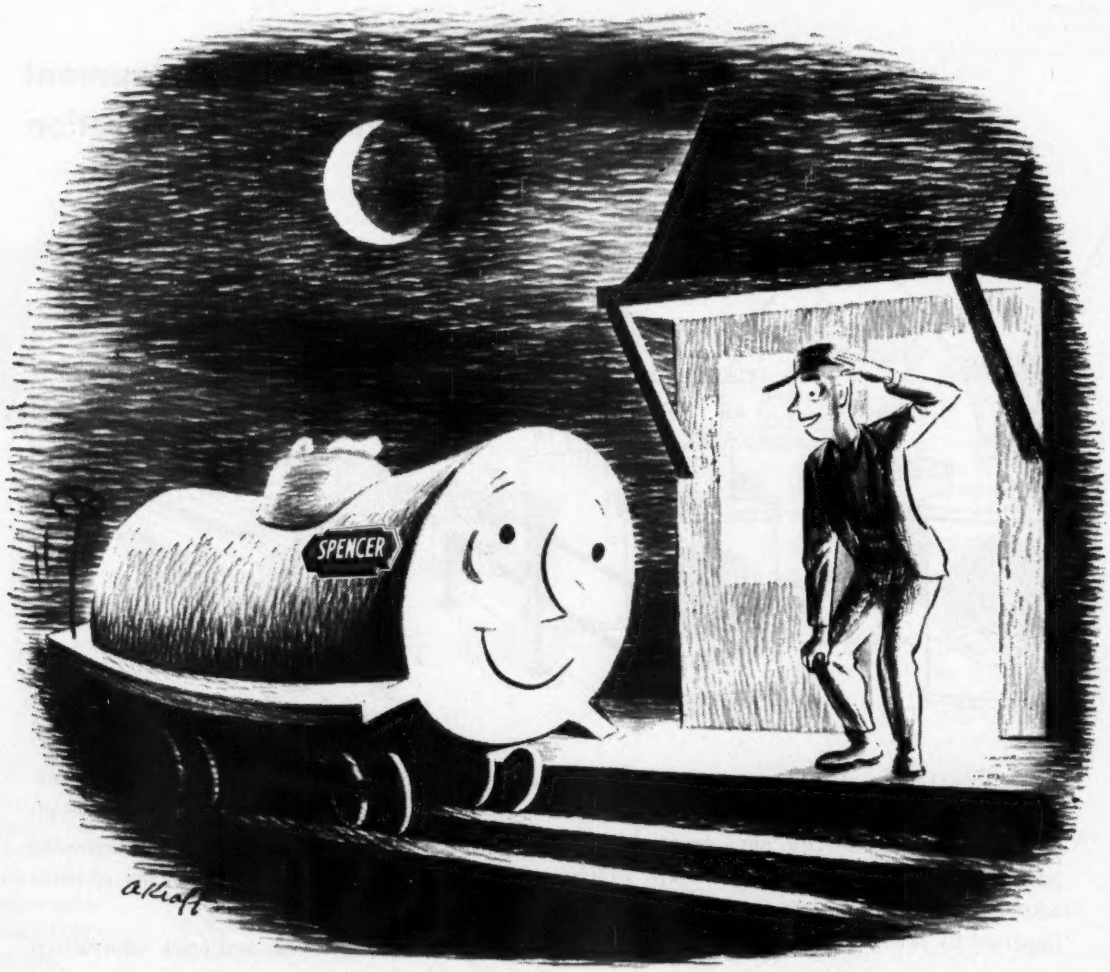

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What's Happening to DPA Phenol Certificates of Necessity?

Company	Plant Location	Amount Certified	Per cent
	COMMITTED		
Hercules	Paulsboro, N. J.	$8,500,000	50%
Monsanto	Monsanto, Ill. Avon, Calif.	5,403,478	50%
Reichhold	Tuscaloosa, Ala.	1,357,000	50%
Standard Oil of California	El Segundo, Calif. Richmond, Calif.	6,580,000	50%
	UNDECIDED		
Loven Chemical	Newhall, Calif.	3,670,000	50%
	OUT OF THE PICTURE		
Salt Lake Refining	Salt Lake, Utah	4,605,000	50%
Salt Lake Refining	Salt Lake, Utah	1,358,000	50%

Oversubscribed—But Slightly

Given a healthy assist from a flood of new cumene-phenol plants on which construction started this year, the Defense Production Administration's goal for phenol production by Jan. 1, '55 is already assured of being met. The goal: an additional 280 million lbs. above 1951 capacity of 343 million lbs. Today's estimated capacity (including facilities under construction): 296 million lbs.—under way, or promised.

What's unusual about phenol certificates of necessity is that in most cases, companies that have applied for tax write-offs have gone ahead with expansion plans. The exception is Salt Lake Refining which transferred over $6 million in phenol certificates to its parent company, Standard Oil of California in Oct. '52. Reason: Standard originally expected to build its cumene plant at its subsidiary's refinery site, later decided El Segundo was a better bet. In the trade-off, all the figures were muddled up, Standard ended up with a single certificate for $6,580,000 at 50% to cover operations at two locations. Latest word on an estimated date for starting production: next Jan. 1. Phenol capacity involved: 35 million lbs./year.

The undecided certificate holder, Loven Chemical, was mulling the idea of phenol production in 1951 and hired a Washington contact man to get a certificate of necessity for a plant site in southern California. By 1952, plans were virtually sidelined—but certificate applications, already under way, went through anyway. Today the picture still isn't clear, but best bet is that Loven is out of the race.

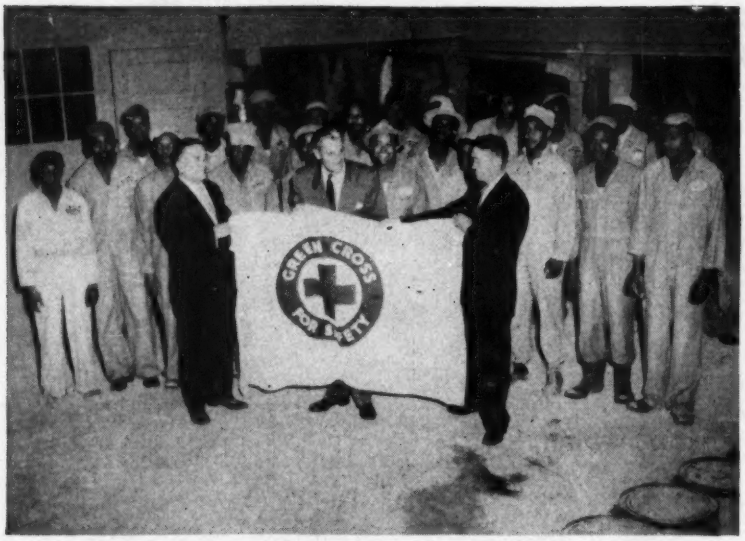
Those producers who've gone ahead on schedule—with the single exception of Reichhold—aren't in production yet, but should be within a matter of months. Monsanto's twin units—at Avon, Calif., and Monsanto, Ill., are due in before year's end—should boost capacity 30 million lbs. Hercules' Paulsboro plant, say company officials, will be ready to roll by July '54. Estimated annual output: 26 million lbs. at a cost of $8.5 million.

Reichhold's unit for phenol production, which received a lift from DPA, has already come onstream. Issued for $1,357,000 at 50%, it boosted output 33⅓%—from 48 million lbs. annually to 64 million lbs.

Latest estimates on the type of phenol production aided by DPA write-offs give a firm nod toward cumene-based units. Hercules and Standard of California both employ the cumene production method; Allied's plant at Frankfort, Pa. (not DPA-assisted), also uses it. If present indications hold true, total cumene-phenol capacity in the U.S. by 1955 will add up to well over 100 million lbs./year. (*CW Report, May 2, '53*).

Not Included: According to DPA reports, there have been a number of other certificates issued for phenol-based products—none of which specifically concern added phenol capacity:

- Dow has received two certificates for the production of bis-phenol-A. Both have been picked up. Amounts involved: $153,400 at 75%; 950,000 at 75%—as of July '53.
- Jefferson Chemical obtained a write-off to produce monyl phenol at Port Neches, Tex., for $280,500 at 40%. But, say officials, the tax assist was specifically for alkalating purposes. Jefferson at the present time produces no phenol.
- Oronite took in several certificates for phenate and sulfonate detergents—all were used to expand existing facilities at Oronite's Oak Point, La., detergent plant. No additional phenol capacity was involved.



CHICAGO'S COLLABORATING TRIO*: Those who set the accident-prevention records reap the insurance-refund harvest of their three years of injury-free work.

Watch for the Jinx

In baseball, when a pitcher gets a good start on what may be a no-hit game, superstitious well-wishers determindly refrain from mentioning this fact for fear of "jinxing" their hero's efforts. A disbelief in superstition permits telling about the feat of a Chicago detergent maker now in its fourth straight accident-free year, and still going strong.

Besides having received a National Safety Council "honor flag" for its safety record, the L. Carlton Mertz Co. is also noteworthy for another reason: its harmonious labor relations, with employees getting both "credit" and cash for their part in the firm's achievements.

No Quits, No Strikes: It's true that Mertz is a small company, having six people in management and office work and 25 production workers. But in turning out the firm's line of detergents, industrial cleaners, heat treatment salts, fluxes, water-treating compounds and glue preservatives, these men handle more than 2 million lbs. of chemicals each month, and more than half of that total is caustic soda. (Mertz has one captive manufacturing operation, making sodium meta silicate; other chemicals are purchased.)

For more than 1,250 days, the plant has operated without a casualty, and this led to a double-barreled ceremony in which were handed to the company the honor flag from NSC and a check from Founders' Mutual Casualty Co., Mertz' workmen's compensation insurance underwriter. That dividend, accruing to Mertz because of the long safety record, was divided among the production employees in proportion to their years of service—"They're the ones who earned it," company President Mertz declares.

In giving his men the credit for this record and the cash along with it, Mertz appeared to be further solidifying the good will between his company and his employees, who are represented by Local 950, Paint, Varnish, Lacquer & Allied Products Workers (AFL). There have been no quittings, no strikes, no lockouts and no acrimonious contract negotiations; and Mertz uses no foremen. "We don't need foremen," the union's shop steward explains. "We know our jobs and do them."

Work and Share: On this point, it seems that Mertz has succeeded in getting a union with an understanding of capitalism and a willingness to act accordingly. "We work hard," the shop steward adds, "because we know that if we don't make money for the company, we don't make any for ourselves."

Robert Martin, union business manager, fully endorses this viewpoint. "As to the union's encouraging productivity," he avers, "I firmly believe that this is one of the main functions of a good union and its representatives."

Mertz has gone on record with the statement that he gets along with his employees better now than before they were unionized four years ago, and also says the union helped make his firm's safety program a success.

Reciprocally, the shop steward's testimonial is, "We like working here because the pay is good and Mr. Mertz treats us right." (Wage scales are higher than for similar jobs in other plants in the area and in most other compounding plants elsewhere.) Martin believes that "as a result of his fair bargaining, Mr. Mertz can count upon the utmost loyalty from his employees."

Safety Incentive: The insurance dividend doesn't amount to very much when divided among 25 men (an average of about $17 apiece), but the way the refunding system works does tend to make the employees more aware of their stake in safety. Some mutual casualty insurers split their annual surplus among all member companies, and the accident-riddled plant shares equally with the perfect-safety plant.

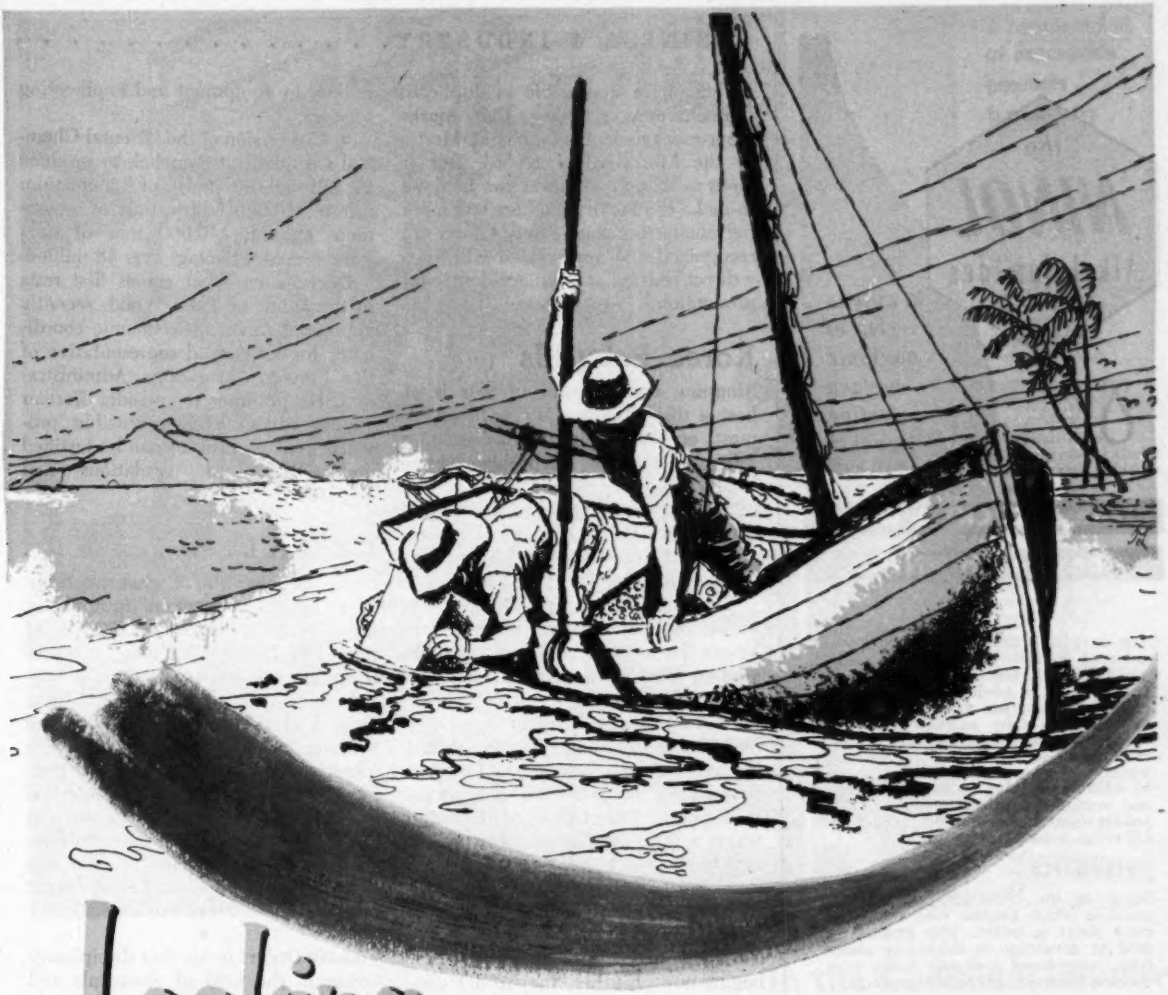
Founders' Mutual, however, uses a different method. Each member company pays a premium based on payroll, and each company's account is kept separately. From premium payments, Founders' Mutual deducts losses paid to that company for injuries and that company's share of insurance costs; and the remainder goes to the client company, part held in the company's account and part paid out as a dividend. A company with a good safety record may get as much as 35% of that balance, and such savings are not pooled to the benefit of poor safety-record plants. Thus, when a dividend is parceled out among employees, they know that it's a measure of their good performance in competition with other companies' workers.

Depression Baby: The Mertz company went into business in 1931, at the depth of the depression. Mertz worked the shop single-handed at first, later got part-time help from George Mailfald, who's now his general manager. Biggest growth has been since World War II, with 21 employees added since V-J Day.

This concern's safety exploits are creating new problems for the insurer, according to J. Thomas Willett, executive vice-president of Founders' Mutual. Out of the 100 companies his firm insures, Mertz is the only one that hasn't had a single compensable accident, and Willett is starting to figure out what next year's dividend will be if the record continues unbroken.

Large chemical companies may find

* Left to right, company President Mertz; Willett of Founders' Mutual; Martin of Local 950.



Looking *for sheep's wool under the sea*

THE "WOOL" taken from the ocean bottom is a *sponge*—Keys Sheep's Wool—native to our Florida coast. It's highly prized because it is said to hold more water than any other natural sponge of equal size.

Just as some sponges have greater capacity than others . . . so it is with lacquer solvents. MEK (methyl ethyl ketone) will hold more lacquer solids because it has superior *solvency*. This means that lacquers containing MEK offer greater covering power at the same spraying viscosity.

MEK is the Number One low-boiling active solvent for both nitrocellulose and vinyl lacquers. Leading formulators have found that MEK cannot be replaced directly by any other solvent without loss in quality or increase in cost.

MEK is one of the Shell "quality group" of solvents, which includes—among others—MIBK, MIBC, and IPA. Your Shell Chemical representative will be happy to discuss the advantages to be gained from using MEK in your formulations.

MEK

We will be glad to send you the complete story on MEK, with the latest laboratory-proved information for lacquer formulators.

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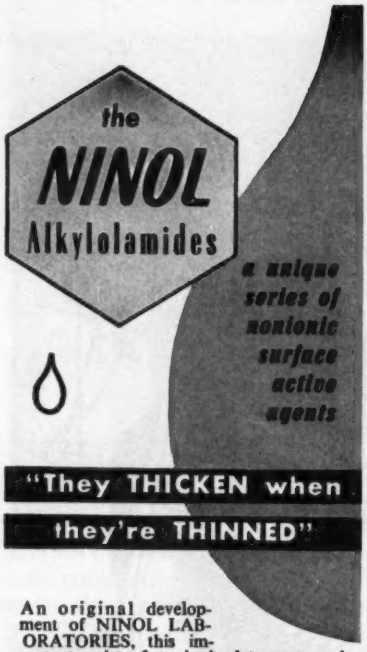


An original development of NINOL LABORATORIES, this important series of nonionic detergents and emulsifiers comprises a group of amides derived from fatty acids and alkylolamines, with individual members ranging from water soluble liquids to insoluble waxes.

In addition to being excellent detergents and wetting agents, the NINOL alkylolamides (amine condensates) exhibit the following unusual properties:

VISCOSITY

Many of the NINOLS form viscous solutions which become even thicker as more water is added. This property is used to advantage in thickening *shampoos, water-based hydraulic fluids, latex systems, cleaners, and other products.*

RUSTPROOFING

Unlike most synthetic detergents, the NINOLS act as rust inhibitors in water due to their amine structure. In *metal processing* they are used as additives to cutting oil emulsions to prevent rusting of the work, and can also be added to the final rinse after cleaning.

FOAM

A wide range of foaming power includes low-foaming grinding aids for *resins* and high foaming *detergents for dishwashing.* Certain types also act as foam stabilizers for *sulfonated detergents.*

EMULSIFICATION

NINOLS are available for emulsifying materials ranging from *microcrystalline wax* and *essential oil* to *synthetic rubber* and *plasticizers.* Certain types are especially effective in forming water-in-oil emulsions.

•

Some interesting NON-SURFACTANT *uses of the NINOLS are as: plasticizers and anti-static agents for plastics; finishing agents for synthetic fibers; lubricants for chain belts; anti-gelling agents for liquid starch; opacifiers for cosmetics.*

Write us about your problem — the right *NINOL* may be the answer

NINOL LABORATORIES, INC.
1717 S. Clinton St., Chicago 16, Ill.

it difficult or impossible to duplicate the chummy intimacy that marks labor-management relations at Mertz, or the Mertz safety record. But it looks as though whatever can be done to make the factory workers feel more personally that their safety efforts are recognized and appreciated will have a direct bearing on both accidents and production.

Korea Rebuilds

Mopping up the ruins of war is at best a disheartening job—with an almost endless chain of discouraging setbacks. In Korea, the problem's even rougher due to continual differences of opinion arising between the Korean Prime Minister's Office of Planning and the United Nations Korean Reconstruction Agency (UNKRA).

But with winter approaching, domestic production of fertilizer can no longer be a subject for roundtable confab. The Koreans lack food; by spring, the cry for fertilizer will be far beyond a plea for help.

As far as the hunger-bitten Koreans themselves are concerned, fertilizer now claims top priority in reconstruction plans. The Office of Planning wants a 300,000 ton/year ammonium nitrate plant to be built at Puk Pyong, near Samchok. But engineering studies made by U.S. administrators and UNKRA stress that electric power shortages may result if construction begins now. Further, they're not convinced that Puk Pyong is the ideal site for a plant. But if and when the go-ahead is flashed (the need for a "prestige" project may overrule economic considerations), UNKRA has its procedure plans ready.

• Bids for design and construction from qualified (U.S. or other non-communist nationalities) will be solicited.

• A further contract on behalf of the Korean firm will be placed with a foreign chemical company "for management and training purposes."

Construction and design costs are estimated by Korea's Planning Office as somewhere between $35-40 million—the bulk of which would come from U.S. aid funds and UNKRA itself. Management contract charges would be an additional expense.

Other fertilizer projects looming for Korea:

• Repair of the PukSam Chemical Co. to raise production to pre-war levels—27,000 metric tons of lime; 15,000 metric tons of calcium carbide; 16,000 metric tons, calcium cyanamide annually. Cost: an estimated $4 million in equipment and engineering services.

• Conversion of the Oriental Chemical Co. plant at Samchok to produce 22,500 metric tons of ammonium nitrate; 10,000 metric tons of ammonium chloride; 10,000 tons of soda ash per year. Pricetag: over $8 million.

Decision on what comes first rests in the hands of Tyler Wood, recently appointed American economic coordinator for Korea and representative of the Foreign Operations Administration. He promises to consider Korean appeals as completely as possible "provided that the projects can be justified under U.S. aid regulations and UNKRA standards."

LEGAL. . . . . .

Glycol Penalty: Use of what was termed a "spurious statement" in applying for a license to export 60,000 lbs. of propylene glycol to a French perfume manufacturer has resulted in a one-year suspension of export rights for a New Yorker, Charles Y. Rofe. The Office of International Trade said Rofe admitted the violation, that his purpose had been to try to resell material he had committed his firm to buy and for which he was afraid he would be held personally responsible. He was employed by the Beck-Kassel export company, now out of business.

•

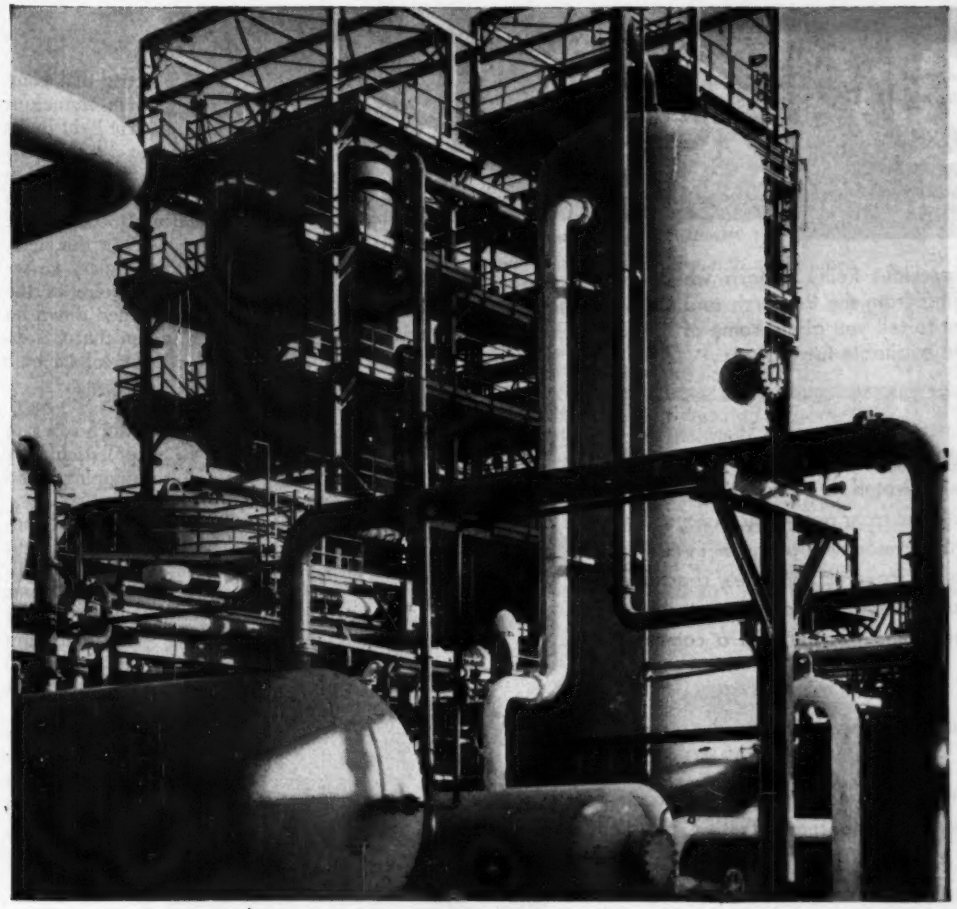
Vitamin Order: In another disciplinary action in the field of chemicals and drugs this week, the Federal Trade Commission held a hearing on the advertising claims used by Unitone Corp., New York, for its vitamin-mineral preparation called B-Amino-Complex or BAC. The hearing examiner ruled that company should drop its claim that BAC "checks deafness."

•

Trust-busting Teeth: The past week brought double evidence that there are still plenty of teeth in the 63-year-old Sherman Antitrust Act.

• At Philadelphia, in a case that caught the interest of the nation's glass manufacturers, U.S. District Judge Allan K. Grim fined six wholesale glass jobbers and six of their officers a total of $30,000. The Antitrust Division of the U.S. Dept. of Justice recommended a fine of $3,500 for each company and $1,500 for each individual after the defendants pleaded nolo contendere to charges of conspiring to restrain trade. The prosecutor said the company officials held meetings and made illegal agreements to fix prices.

• At Trenton, N.J., a decision by Federal District Judge Phillip Forman



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Reilly reports
TO INDUSTRY
From the Research and Development Division, Reilly Tar & Chemical Corporation
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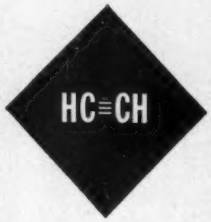
In the previous Reilly Reports we discussed various compounds emanating from the Research and Development Division. Today, we want to tell you about some of the facilities and "know-how" we have available for industry.

For more than a decade at least half of our research budget has been devoted to studies on the synthesis of organic chemicals from acetylene. As a result of our research and development program in this field, we have not only discovered some new reactions of acetylene but also developed some new techniques for affecting acetylene reactions on a commercial scale.



In the first quarter of this year, Reilly put on stream a multi-million pound plant for the synthesis of pyridine as well as alkyl pyridines. This synthesis is also based on acetylene.

Other chemicals made from acetylene are now at the development stage and should become commercial-scale chemicals within the year.

The first commercial production of acetylene alcohols was inaugurated at Reilly about two years ago after successful process runs in the pilot plant. Today, we have in operation a one-half million pound plant manufacturing several acetylenic alcohols.

Reilly's experience, "know-how", and facilities in conducting acetylene reactions are available to custom make chemicals for industry. If you have a problem involving acetylene chemistry, we suggest you discuss it with us.

the Reilly Researchers

Reilly CHEMICALS
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B&I . . . . . .

took from General Electric that company's exclusive rights to numerous patents for making electric light bulbs and parts. In this 12-year-old case, GE was accused of holding a monopoly in the incandescent lamp field. Forman ordered GE to dedicate to the public all of its existing patents in this field, and to share with the industry all related patents it may acquire in the future. However, he turned down an Antitrust Division motion that GE divest itself of at least 50% of its bulb manufacturing facilities.

•

Pollution Proceedings: More cases in which violations of air-pollution laws are charged have been popping up in local courts.

• Philadelphia's Air Pollution Control Board is stepping up its campaign to enforce the city's air-pollution ordinance. Pizor Container Corp. was fined $100 in magistrate's court, and the Exhibit Co. was ordered to stop its paint-spraying operations until steps are taken to eliminate paint fumes.

• Kelly-Forsyth Corp., facing a charge of violating a city antismoke ordinance, is planning to close down its plant in Ithaca, N.Y., and move to Port Leyden, some 90 miles away. The company denies that the litigation prompted the decision to move.

FOREIGN . . . . .

Caustic Soda/Indonesia: The Indonesian government will build a caustic soda plant at Waru, near Surabaya, due for completion by the end of 1954. Cost: 60 million rupees: output: 3,000 tons/year, about one-fifth the country's requirements.

•

Cooperation/India, Switzerland: A joint Swiss-Indian concern to produce heavy chemicals has been formed in India under the name Heavy Chemicals, Ltd. Initial project: to build a plant at Tuticorin to produce caustic soda (10 tons/day), sodium hypochloride, titanium tetrachloride, iron chloride. Equipment will be provided by two Swiss firms, Krebs and Co. AG, Zurich, and von Roll AG, Zurich. Authorized capital: 5 million rupees.

•

Plant Hormones/Japan: Assistance-for- royalty agreements between Dow Chemical Co. and the Nissan Chemical Industry Co. and Ishihara Sangyo Co. of Japan for the production of plant hormones have been approved by the Foreign Investment Council. Hormones involved: 4-chloro-phenoxi-acetic acid, its salt and ester. Dow has held exclusive production and

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QUALITY CONTROL
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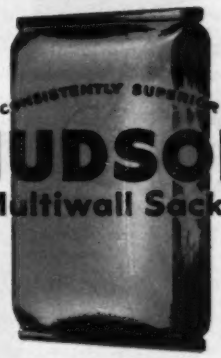
If you haven't checked on your packing and shipping recently, do so now when the squeeze is on your profits between rising costs and lower selling prices. You will find the extra points which Hudson can give you make tangible savings — enough to make the difference.



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B&I . . . . . .

sales patents in Japan, will trade formulas and other scientific know-how for a 5% cut of net sales to all Far Eastern countries, including India.

Isihara Sangyo signed another contract lately—with the Glidden Co. to produce Spred Satin, Glidden's latex emulsion paint. Royalty: 5% of net sales for three years, 3% thereafter. Initial production planned: 40,000 gal./month by spring of 1954, 120,000 gal./month after 1955. Sales territory will encompass the entire Far East.

•

Phosphoric Acid/Israel: Israel's Ministry of Development is working out plans for a 60,000-ton phosphoric acid plant at Rurnub on the northern Negev desert. Other contemplated annual capacity: 37,000 tons of phosphoric salts, 32,000 tons of soda ash, 80,000 tons of triphosphates.

KEY CHANGES. .

Harry Swem, to vice-president, Texas Gulf Sulphur, New York.

Francis Gleason, to vice-president, Schering Corp., Ltd., Montreal.

Howard Foster, to treasurer, Air Reduction Co., New York.

Roger Milliken, William Gage, to directors, W. R. Grace & Co., New York.

J. H. Cole, to superintendent, California Standard Oil's chemical division, Richmond, Calif.

Eugene Cashman, to control manager, Du Pont's Grasselli chemicals department, Wilmington.

Joseph Lee, to sales manager, McLaughlin Gormley King's chemical division, Minneapolis.

John Taylor, Jr., to sales manager, Deere & Co.'s Grand River chemical division, Tulsa, Okla.

John LaBelle, to director of sales, **Richard Bishop,** to director of research, Foster Grant's petrochemical division, Leominister, Mass.

Raymond McNamee, to manager of research administration, **Bruce Miller,** to assistant, Union Carbide and Carbon, New York.

Franklin Johnston, to superintendent, Carbide and Carbon Chemicals' research and development department.

W. P. ter Horst, to consultant, McDonough, Md.

DIED . . . . . .

Victor Berman, 69, president, Onyx Oil & Chemical, Jersey City, N.J.

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NONYL PHENOL

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Description:

Jefferson's nonyl phenol is a mixture of monoalkyl phenols, predominantly para substituted and is a clear viscous liquid. The side chains are isomeric branched alkyl radicals.

Sales Specifications:

Specific Gravity at 20/20 °C.	0.94-0.95
Hydroxyl Number	245-258
Color, Pt-Co Scale	300 max.
Appearance	Clear and substantially free of suspended matter.
Boiling Range, ASTM (760 mm.), °C.	
IBP:	287° min.
5%:	290° min.
95%:	302° max.

Suggested Uses:

1. An intermediate for detergents, emulsifiers, etc.
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4. An intermediate for other plasticizers
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6. An antioxidant

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Briefs

From recent literature

No. 6 in a Series

Modified phenol-aldehyde resins for coating compositions to give films which are markedly resistant to weathering and are otherwise durable, are relatively inert toward, and compatible with, pigments and fillers, are smooth, have high gloss, are resistant to water and alkali, and retain their hardness under conditions of high humidity, can be obtained using nonyl phenol and an aldehyde as starting materials.

A fire extinguisher compound which is noncorrosive can be produced by dissolving in water 1 to 10 parts of sodium nitrite per 10 parts of an alkylated phenolethylene oxide condensate. The ingredients are mutually soluble in a dilute water solution and do not react to accelerate corrosion in a concentrated solution.

New thermoplastic compositions which are particularly useful in coating formulations, waxes, insecticidal compositions, etc., may be prepared by condensing alkyl phenol with formaldehyde and a higher fatty acid having at least 8 carbon atoms, converting the condensation product to a metal salt, and adding a fatty alcohol of at least 8 carbon atoms. The composition is soluble in gasoline, kerosene, and various petroleum naphthas. When used on metal, the protective coating is a tough, adherent, water-repellent film which may be removed when desired by wiping with a cloth dipped in kerosene.

A washing powder containing a synthetic, soapless, oily liquid detergent, can be produced by mixing a solution of the polyethylene oxide condensation product of an alkyl phenol with the sodium salt of carboxymethyl cellulose, sodium carbonate, sodium bicarbonate, and sodium sulfate. The detergent does not tend to separate on storage from the inorganic constituents used to make up the powder.

These developments are abstracted from recent publications or U.S. patents. They may suggest applications of Jefferson Nonyl Phenol in your products or processes.

target

Motor City Invasion

Last week in Flint, Mich., the automobile world's eyes were on Chevrolet as it showed off its Corvette sports car, the first plastic-body car scheduled to be produced in anything like substantial numbers.

The chemical world, however, while it turned one eye toward Flint, kept the other on Ashtabula, O. That's where the reinforced plastic Corvette body is being built—currently by the slow "bag molding" method, but soon by use of matched metal dies.

The latter will be the first big advance in this field toward mass production; and it will reveal many technical "targets" for chemical manufacturers to shoot at if they are to invade successfully the car body field even to the limited extent represented by such a venture as Chevvy's.

Not that chemical suppliers haven't already given molders a hand in bringing reinforced plastics for car bodies (as well as myriad other applications) to their present state. Nor that anyone thinks reinforced plastics—assuming all production problems will be solved—pose any immediate threat to steel in the auto industry. But the Corvette is the first big test, and its outcome can significantly advance or retard the acceptance of plastics in auto bodies.

Dribble for Now: Only three cars a day are being assembled at the Flint plant, and total production this year won't exceed 250 Corvettes. At about the turn of the year, however, assembly operations will be shifted to St. Louis where the schedule calls for output of 1,000 cars a month through 1954.

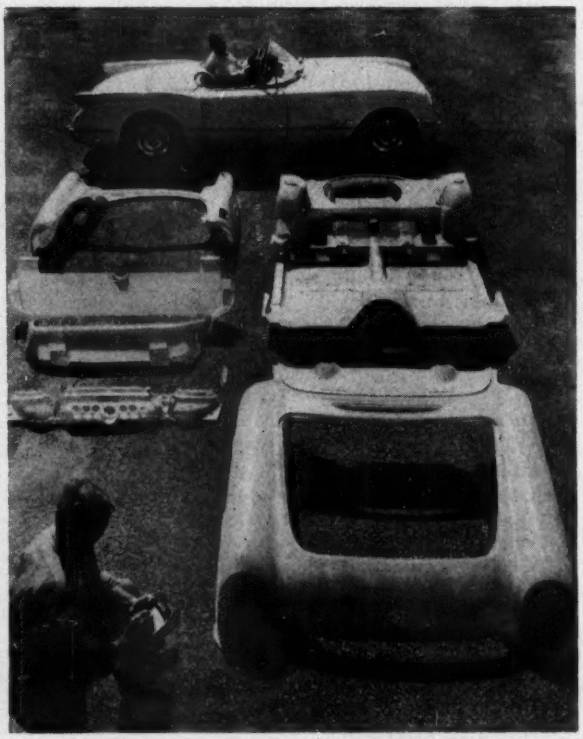
Supplier of the bodies is Molded Fiber Glass Body Co., which has a contract to make 10,000. This company has just built a new $420,000 plant in Ashtabula, and is now moving its equipment into position. Production on some parts should start there next month; the schedule calls for 20 bodies a day in December, 30 a day in January and 50 a day thereafter.

While waiting for delivery of the matched metal dies to turn out body parts, Molded Fiber Glass subcontracted with Lunn Laminates, which also has a plant in Ashtabula, for 300 Corvette units (*CW, Newsletter, July 25*). As Molded's dies have been coming in (all aren't expected until February or March), they have been put into production in temporary facilities; now they are being moved into the new plant.

Reason for picking Lunn Laminates (also one of the pioneers in reinforced plastics fabrication) is that it has much know-how in "bag molding." The bag molding technique employs a mold consisting of a rigid part that may be made of metal or plastic, and a flexible part, an elastomeric sheet of some type. When the materials—glass fiber, resins, filler, catalyst—are placed in or "laid up" on the rigid part, the flexible sheet is clamped down over the mold, and this "bag" is evacuated. Then air pressure exerts the necessary pressure as the resin sets.

Tooling costs for bag molding are about a fifth of costs for press molding, but the former is pretty much a slow, hand operation. Molded Fiber Glass people are confident that it can never approach their method of matched metal dies when they get into production. In this process, as the name implies, both parts of the mold are made of metal; and naturally more than atmospheric pressure is used.

Rate of production, of course, is considerably greater than that achieved in bag molding—an estimated 20 times faster if performance comes up to expectations. Molding cycles at Molded Fiber will run 3-6 minutes per part. As of now, 61 parts go into the body.



CORVETTE AND PARTS*: Big test for reinforced plastics.

* Clockwise from "checker" at lower left: instrument panel, bulk head and seat back, rear fender top panel, underbody and front end.

On the Spot: Resin and fiber glass makers, estimate of the significance of the new operation to the future of reinforced plastics is clear: the molder's present and potential suppliers have their men in the plant now. (And they have been working with Lunn Laminates to help improve its manufacturing techniques, too.)

Obviously if existing polyesters

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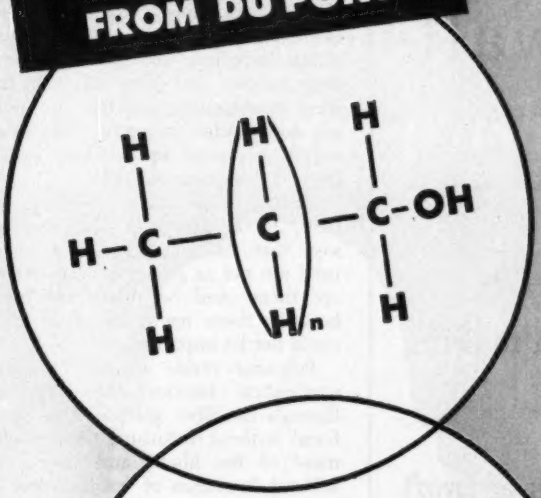

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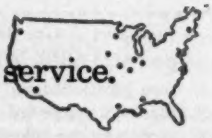

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and fiber glass reinforcing were not satisfactory to produce body parts in large numbers at relatively low cost, the Corvette project would not have been undertaken. But both raw materials suppliers and molders know they haven't yet come up with the ideal combinations, and they are looking for greater strengths and faster curing to speed up molding cycles beyond those now possible.

Molded Fiber Glass Body's president, R. S. Morrison, for example, says that the polyester resins being used are not as strong as he'd like to see them. And he thinks the bond between these resins and fiber glass could not be improved.

Polyester resins are used in this application because they disperse through the fiber glass mat or "preform" without disturbing the arrangement of the fibers, and they cure without formation of volatiles and at relatively low pressure (100-150 psi.) and temperature (225-250 F).

But the resins shrink 6-8% in curing, and this emphasizes the glass fiber pattern; it shows up as highlights even after the material is painted. Epoxy resins, says Morrison, would be ideal in this respect but they have shortcomings, too: their flow characteristics and other curing properties aren't up to those of polyesters—and they are relatively expensive.

All in One: The resin makers, for their part, are in a race to turn out a general-purpose polyester resin for the auto body that the plant can easily modify to make it suitable for a particular molding job. For instance, the resin used in the big (88 sq. ft.) underbody must necessarily have greater flow than that used in making the hood. The former will get a 6-minute cure in the matched dies; the hood, only a 2½-minute cycle.

Then, too, a flexible resin is preferred for outside parts like fenders and hoods, while a rigid resin is the choice for inside and structural parts.

Fiber glass manufacturers expect that improved surface treatment of the fibers will give higher wet strength retention, a better bond with the resin, and an end product in which more of the glass fiber's strength is utilized. With some resins, treating the fibers with silicones does the job.

To eliminate the fiber glass pattern's showing through the resin and paint, tests are being run on shorter fibers than are generally used—⅛ in. in length instead of 1¼ in.

On one point—moisture absorption by the plastic—there is a difference of opinion among Detroit people. Some

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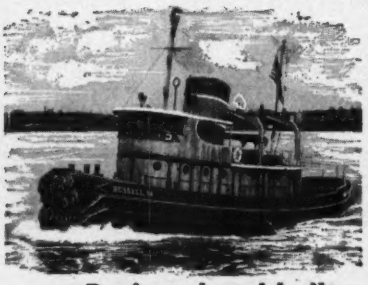

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auto makers claim that excessive moisture causes the surface of the body to "rise", may weaken points around "hardware"—i.e., door latches, handles, other places where metal comes in contact with plastic. But Chevrolet's chief engineer, Ed Cole, says this problem has been whipped in the Corvette, that any rise is insignificant.

Mass in Miniature: On the question of how big the potential market for reinforced plastic cars is, it's a lot harder to get an opinion from Chevrolet or any other car maker at this time. These figures, however, make it rather clear that no one need look for anything like the mass production that has come to typify the motor industry for some time:

- The "break-even" point between steel-body and plastic-body cars, according to Cole, is 15,000 units. That is, if Chevvy produced that many Corvettes, to go beyond that point would cost more per car than it would if steel were used, given today's raw materials costs and technology.
- Chevrolet is aiming at 10,000 units next year. But there are 7,600 Chevvy dealers. So there won't be enough for two per dealer even if the new plant meets its schedules.

The popular conception that the "plastic car" will be a light and inexpensive one is hardly borne out by present realities. For the time being, any such autos that will be turned out will be those with a limited market—composed mainly of buyers interested in special models.

The Corvette, although the body at 411 lbs. weighs about 200 lbs. less than a comparable steel body, offers no impressive weight saving. Curb weight of the car is 2,880 lbs., compared with 3,250 for a four-door Chevrolet. Reason is that the frame is beefed up to give greater rigidity and stability. (And the price tag is $3,490 plus state and local taxes and shipping charges.)

Cheap to Tool: But though plastic body manufacturer is limited to relatively small runs by mass-production standards, therein lies one of its chief advantages: a company can use this method to turn out prototypes of models, or a special model for which there is a limited demand.

Tooling costs for the Corvette, for example, amounted to "less than half a million dollars", bringing the total investment in plant and equipment to a million dollars. Had Chevvy tooled for a steel-bodied Corvette, the cost would have run to $4.5 million.

This advantage as well as the competitive necessity of keeping up with developments in new materials of construction make it impossible for automobile manufacturers to ignore reinforced plastics, even if they should be so inclined. And they obviously are not ignoring them.

Although Chevrolet is the only one in production, Kaiser is in what it terms "preproduction stage". (Kaiser originally said it would make a model called the DKF-161, but internal matters have slowed this project.) It is, however, being supplied by Molded Fiber Glass and the Winner Manufacturing Co. (Trenton, N. J.). But there is no indication of when Kaiser will produce the car, since renamed the Kaiser-Darrin Model 161.

Other companies—Ford and Chrysler among them—have experimented with plastics for years, but there is no word of any early move by any of them.

Worth Working For: Scotching the advent of "plastic cars by the million tomorrow" does not mean that there is not a healthy market for resins, fiber glass, catalysts and fillers now. And it will grow, especially if the new plant goes over with a bang.

The 61 plastic parts in the body will weigh about 150 lbs. (chrome strips fitted over joints to conceal connections, hardware, etc., increase weight of body) of which 60% is resin, 40% fiber glass reinforcement. About 25% of the resin will be filler. Costs are about 42¢/lb. for the resin; 60¢/lb. for the fiber glass; about 1½¢/lb. for filler (calcium carbonate); and about $1/lb. for the catalyst (benzoyl peroxide). Multiply these amounts by 10,000, and you get a nice piece of business for the Corvette alone.

Considering reinforced plastics for the entire car body, however, obscures what may also be a considerable market for individual pieces in cars. James Lunn, whose company, Lunn Laminates, may be more or less the unsung hero of the Ashtabula operation, thinks that there may be as big a market as $30 million in the auto industry by exploiting such opportunities.

One obvious place where reinforced plastics could fit in would be for the tops of hard top convertibles. These would, admittedly, be more expensive than steel tops. But Lunn points out the hard-top buyers are willing to pay a premium for special styling, and, since plastic would eliminate the need for fabric roof lining, the premium might not have to be very much.

Sums like $30 million spell pretty big business to chemicals makers. That's why they're on hand in Ashtabula to make sure their products pass the big test.

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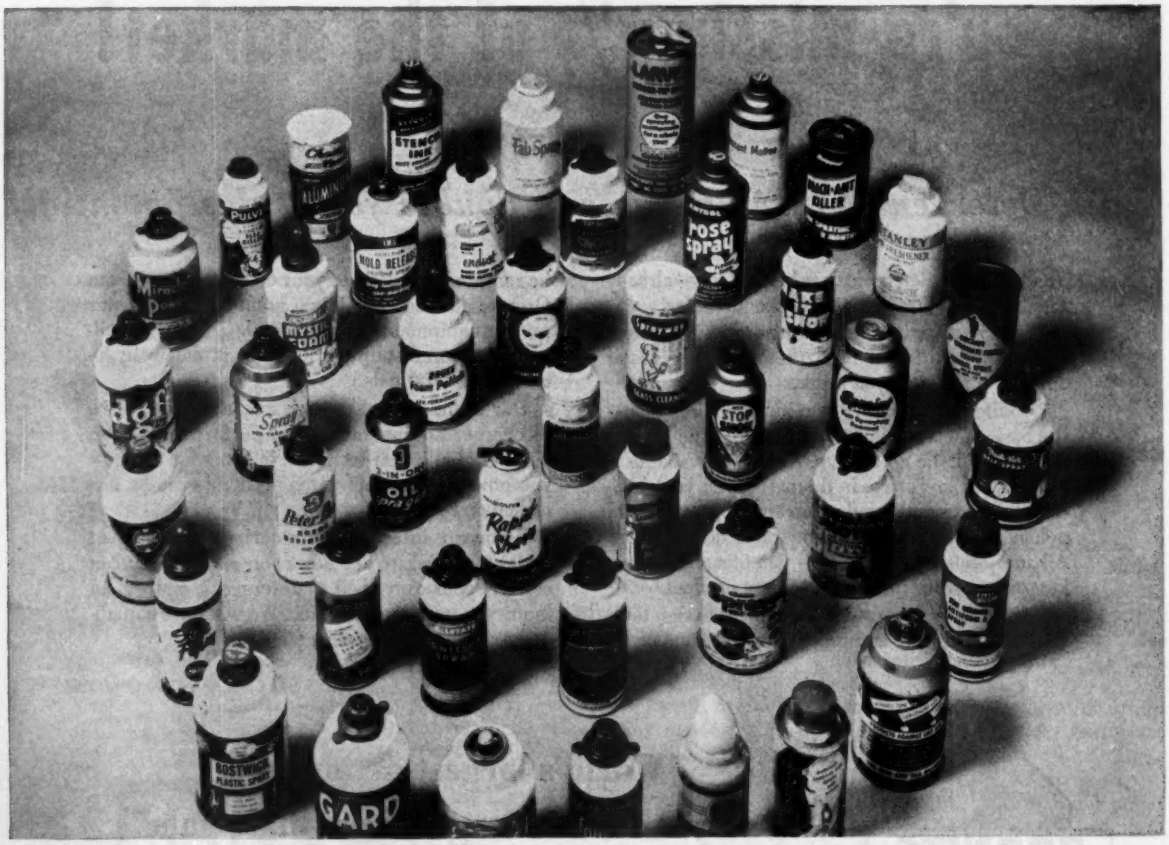
The sketches at right show a cross section of typical space-spray or surface-coating and foam-type aerosol containers. Note that the shaded area at the bottom consists of a combination of "Freon" propellent and active ingredients in liquid phase. In the unshaded portion above, the "Freon" propellent is held in vapor phase at approximately 35 pounds pressure at 70°F. This pressure, which remains virtually constant until the can is empty, serves as the propellent force, and when the valve is opened, the solution is pushed up the outlet tube or standpipe, through the valve and out the discharge noz-



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The aerosol method of dispensing appeals to consumers because it offers many advantages over other types of containers. For example, aerosols are more convenient, easier to use, quicker and do a more effective, more thorough job. In addition, they are economical because a little of the product will do a lot.

Retail dealers everywhere have been quick to appreciate the sales potential of this modern method of packaging, and many have promoted aerosol products extensively. Consumers, too, have shown their hearty approval of aerosols by steadily purchasing more and more of them. Recent figures released by the C.S.M.A. (Chemical Specialties Manufacturers Association) show that nearly 100 million units of aerosol products were packed during 1952 . . . more than double the number packed during the previous year!

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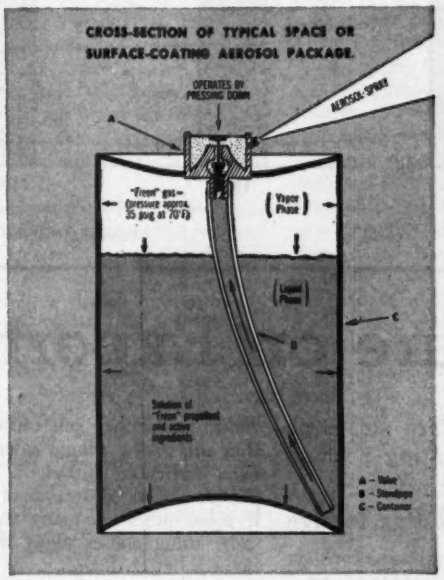

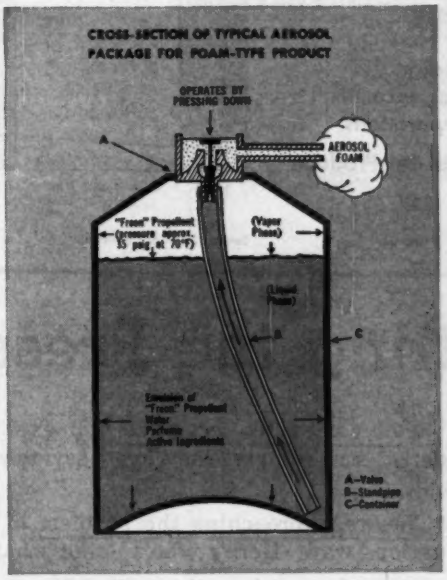

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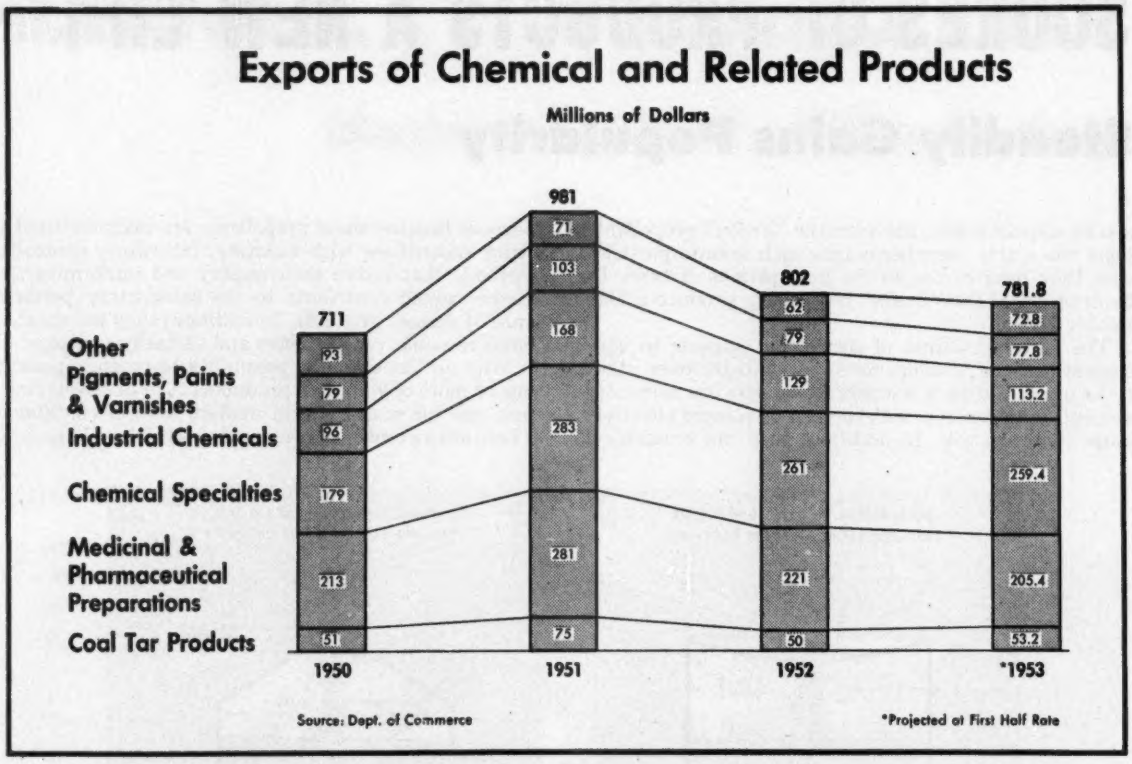

Putting the Pressure on Exports

Some companies recognize that exports are not to be taken lightly. Accordingly, they are busy formulating positive export policies.

They're approaching the problem of boosting foreign sales in various ways. Here's who's doing what.

For the second straight year chemical exports continue to drop. Some companies are worried about it—and just worrying. Others are striving, right now, to improve their methods of selling abroad.

For instance, this spring Dow opened offices in Zurich and Montevideo. The one in Zurich serves as the headquarters for Dow Chemical International Ltd., a subsidiary handling sales in Europe, the Near East and Africa. The one in Montevideo does a similar job for Dow Chemical Inter-American Ltd., a second subsidiary, which looks after markets in the West Indies, Central and South America.

Prompting the move was the desire "to establish closer working contacts with sales representatives and customers abroad." The offices are also dubbed as "marking initial steps in an overseas expansion program."

Allied Chemical is now also making "a broad over-all study" to determine which of various exports methods will best suit its needs. To date the company has sold simply f.o.b. New York. But, currently, with some supplies loosening up it's going to start to dig into overseas sales.

Not Easy: But the decision on just how to sell abroad is a tough one. A just-completed CW survey points up that companies experienced in foreign selling have ended up with all sorts of arrangements.

Monsanto, one of the pioneers in exporting, reports: "The greatest volume of our business abroad is done by Monsanto subsidiaries. Almost all the rest is through exclusive agents, and only a small amount goes through U.S. exporters."

The reason U.S. exporters "usually do not fit in with the Monsanto organization" is that "one cannot be sure they are giving proper sales coverage of a particular market . . . and one cannot always be sure of their loyalty if some other company making the same thing comes along and makes them a better deal."

Mathieson, which did not get really interested in the export business until 1949, explains it depends mainly on agents. Reasons: "They don't present an overhead problem, they allow more flexibility than subsidiaries."

With 12 affiliates and 42 agents in foreign countries, Reichhold has some definite opinions on the most effective way to do business outside the United States.

One of its policies is to make its agents exclusive. In Reichhold's eyes, an agent is "an ambassador, not just a jobber." Another policy: not to own more than 49% of a foreign plant. Reichhold has discovered that foreign governments are happiest when control is left in the hands of their own citizens.

Most of Koppers' foreign sales are through agents. Export sales executives don't share the belief that agents

should be exclusive. The company has found that the exclusive ones are the hardest to get rid of—in some countries—Cuba and the Dominican Republic are two—it's against the law to drop an exclusive agent.

Licensing Agreements: Du Pont says that two-thirds of its foreign sales are made through distributors, one-third through subsidiaries. Like many other companies, it does not regard licensing agreements as a method of selling. However, it utilizes licensing agreements on a world-wide basis.

They are employed, of course, mainly when foreign demand can't be met by the normal means of selling or "when others are in a better position to exploit the market."

According to Schenley Industries—which rates its pharmaceutical sales overseas as "very substantial"—licensing agreements have the advantage of involving no investment. One disadvantage, says Schenley, is that the U.S. company receives royalties only —"profits go to the licensee." (One way to overcome this problem is to sell know-how to a foreign company in return for a minority equity holding in the company. That's how Monsanto works it.)

But while foreign sales policies vary from company to company, most are aiming to reverse the present dismal trend in exports—and with good reason. The future shapes up this way:

If chemical production in the United States lives up to expectations, it will reach some $25 billion in 1975. If exports of chemicals and related products follow the same pattern, by then they should be $5 billion. And they must, if domestic markets are not to be glutted. That was cited last year in a McGraw-Hill International Corp. analysis addressed to the chemical industry. The same study pointed out, however, that this $5-billion export potential will not be reached "unless U.S. manufacturers study their markets, watch their prices, and sell intelligently and aggressively . . ." Reason: competition—especially from Germany, Italy, Britain, and Japan—has already made a sizable dent in U.S. export business.

Whether the statement was intended as a warning or a prediction, it pretty well sums up what is already happening to our overseas markets.

A Way Out: But, we can, it's agreed, more than moan about the problem. One solution, in the opinion of Peter Grace, Jr., a director of Grace Chemical Co.: "The soundest way to maintain our large export volume . . . is by exporting capital to foreign countries in the form of investments."

Many U.S. firms realize this. Movement of direct investment capital to western European countries during the 1946-51 period is estimated at some $287 million.

Dollars have flowed south, too. In Brazil alone, direct U.S. investments jumped from $240 million in 1940 to $686 million in 1951.

Yet at the very time U.S. firms need to invest overseas, investing is becoming more difficult. That's the observation of the Dept. of Commerce, which has just completed a study on "Factors Limiting U.S. Investments Abroad."

One of the most important conclusions of the study is that our investments abroad will encounter more and more interference from foreign governments.

Such interference, the study hints, will mean that in the future there will result in fewer 100%-owned American subsidiaries abroad, not more.

The western European countries that fare best in the report are the United Kingdom, the Netherlands, and Germany. Belgium, Commerce observes, has no great need of American investments.

France with its ever-shuffling cabinets and with the absence of clear-cut principles and rules applying to private foreign investments makes the investment climate uninviting. Italy is even less inviting because of private and public monopolies and because it's hard for investors to convert capital and profits into dollars.

The United Kingdom, on the other hand, continues to remain a good risk for American capital. At the end of 1950, it was the third most important country for direct U.S. investments and accounted for nearly half of the total U.S. capital in western Europe.

Since World War II, investments there have increased by two-thirds. The chief objective: to obtain access to the vast and lucrative sterling area and other soft-currency markets.

Germany is not regarded as being as secure as the United Kingdom. But because of its extensive network of bilateral trade agreements goods produced there may be admitted by other countries more readily than are similar goods produced in the United States, says the Commerce study.

The Netherlands has proved attractive to many American concerns in the postwar period. However, most don't care for the strong regulatory role the Dutch government plays in the country's economy.

In a like manner, the 132-page study covers advantages and disadvantages of investing in leading countries on other continents. In South America, Brazil is a country that holds

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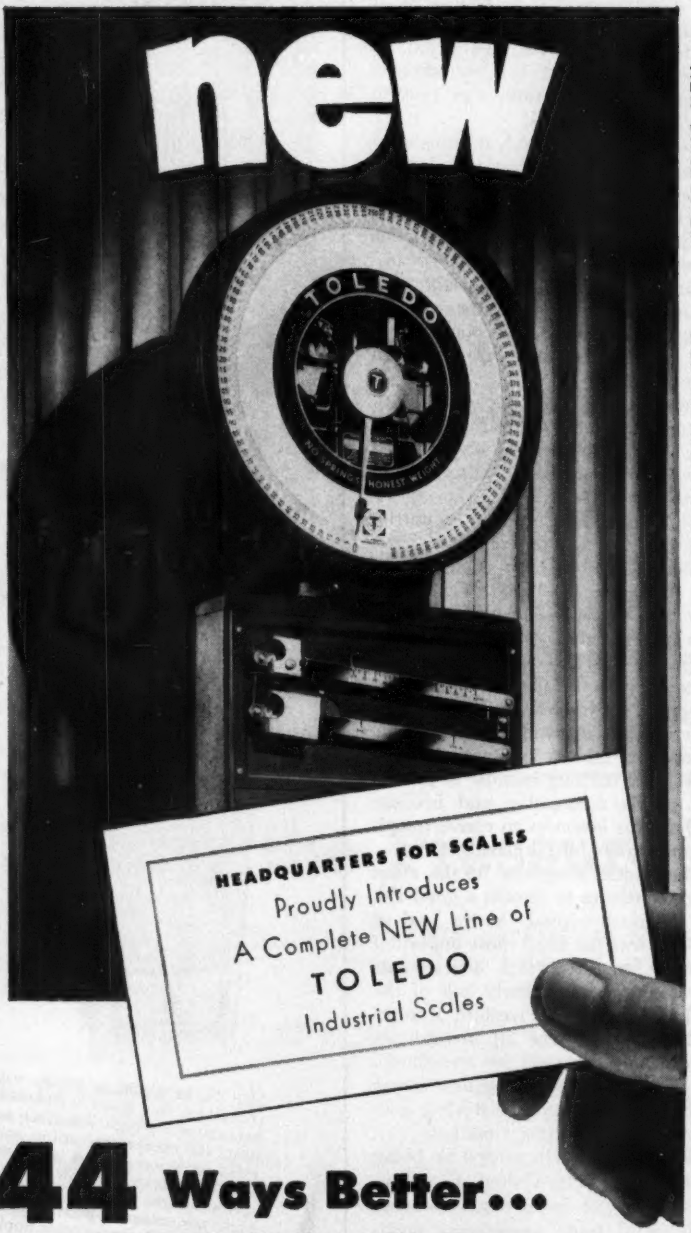

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up well in the study, Argentina not so well. In Japan, conditions tend to discourage investments rather than encourage them.

Closer To Home: But it's not only increasing foreign government interference in the investment field that the study criticizes. It also notes that "one of the most consistent causes of difficulty" for American firms is "the failure to investigate properly and to do . . . preparatory work before actually placing its capital."

To reduce such difficulties, firms should utilize more reports like this one. Management consultants who do preliminary work for companies wanting to invest abroad have a lot of respect for Commerce publications. "If the Commerce Dept. has made a study of a country, you can bet it's a good one," a New York management consultant official said recently.

On the positive side is this fact: most countries are still in great need of both American capital and know-how and the end of that need is not in sight.

Thus it appears that the current trend in exports might be reversed. But that won't happen unless plenty of companies are determined to make it happen.

•

Canadian Industry: The 1953 edition of *Canadian Trade Index* is just off the press. On its 1170 pages are details of 10,000 Canadian manufacturers and their products. Obtainable from Canadian Manufacturers' Assn., 67 Yonge St., Toronto, Ontario, at $7.50/copy.

•

Chemical Index: Latest edition of this booklet describes 60 company-produced chemicals. Copies may be obtained from Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4.

•

Foam Plastic: *Nopco Lockfoam—New Foamed Plastic* is the title of a 28-page booklet on properties and applications of "foamed-in-place" plastic. For free copy, write Lockfoam Division, Nopco Chemical Co., Harrison 51, N. J.

•

New Warehouses: Rohm & Haas is doubling its ammonium sulfate storage capacity at Bristol, Pa. Completion of its new 14,000 sq. ft. building, being erected by Luria Engineering Co., is scheduled for this month.

• Merchants Chemical Co., New York, has added a new warehouse at 4007 Crittenden Drive, Louisville, Ky. C. M. Morgan is acting district manager of the Louisville territory.

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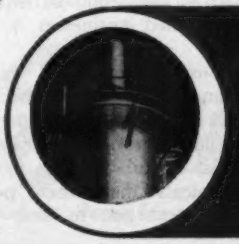

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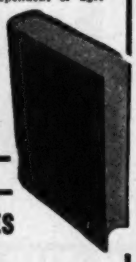

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TANKS FOR CORROSIVES: Out of new regulations, new designs.

New Code for Tank Truckers

Interstate Commerce Commission's revision of its specifications for tank trucks carrying corrosive liquids, issued recently as Notice 12, represents the first change in tank truck construction regulations since bulk chemical hauling blossomed into the big business it is today.

The new specifications, superseding the old rules (MC 310) in effect since 1940, have tank builders overhauling their blueprints to bring models into conformity with the revised code. And chemical shippers are busily determining the effect the new rules will have on their operations.

One important effect all will welcome: tanks lighter than present models can now be built; new tanks can be realistically designed for a specific job.

Density Divisions: Briefly, the new set of specifications abandons the principle of establishing general requirements for corrosive liquids. It classifies liquid corrosives according to their specific densities.

Three classifications have been set up: (1) liquids under 10 lbs./gal.; (2) 10-13 lbs./gal.; and (3) over 13 lbs./gal. Within these three groups, shell thicknesses of the tank are governed by (a) its radius, (b) the distance between bulkheads, and (c) its capacity per inch of length.

Other highlights of the new rules:

• A formula set up to relate steel requirements to other metals so that nonferrous metals may now be used.

• No thickness limits for linings. Thus some of the new resin and rubber compounds that are sprayed on the tank shell can be utilized.

Also included in Notice 12 is a "grandfather" clause, to allow tanks constructed under previous regulations to remain in use.

War Boom: Today there are 16,000 for-hire tank trucks on the road. Ten per cent of these carry corrosive chemicals. Last year the industry paid out $130 million for new equipment and fuel, and carried over 400 times its standing capacity of 83 million gal. Producer-owned trucks carry 10-20% of the traffic.

This is a vastly different picture from that of a dozen years ago. Before World War II, virtually all bulk chemical hauling was done by the railroads. During the wartime squeeze on tank cars, the Office of Defense Transportation limited rail tank cars to hauls of 200 miles and over. Trucks began to take up the short-haul slack.

The truckers started out under advantageous conditions. Most of them had been carrying petroleum for years and so had technical experience and established businesses to back them up.

Business expanded rapidly, and chemical hauling soon became a large part of the total volume moved by liquid carriers. These operations were so successful with the more common chemicals that when peace came, truckers began to look around for

CASE HISTORY
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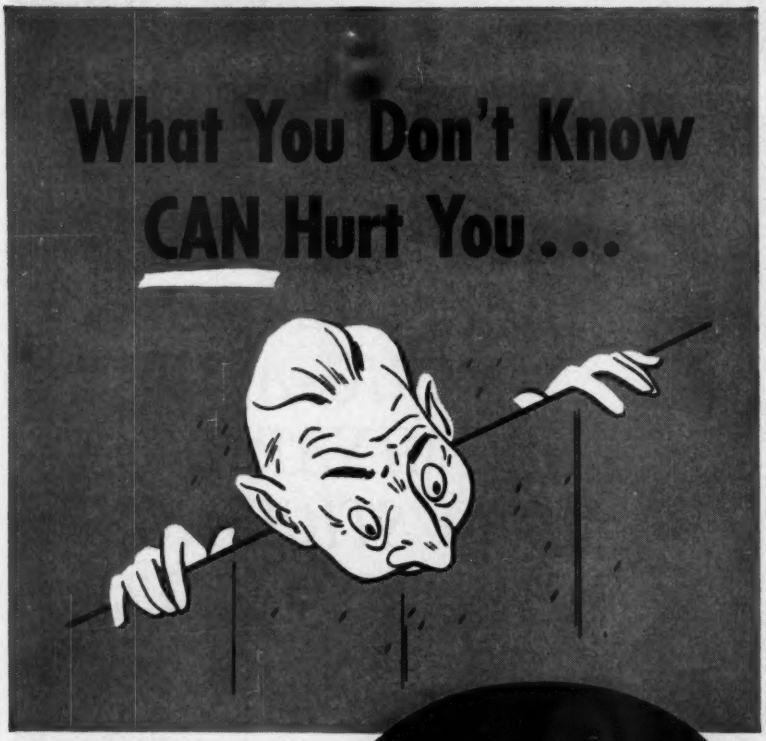

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more challenging projects—sulfuric acid hauling, for instance.

The variety of items hauled has expanded concomitantly with the growth in volume. There are now more than 300 liquid commodities moving by tank truck, ranging an alphabetic gamut from absorption oil and acetic acid to liquid yeast and zinc resinates. And now several companies devote all their services to handling chemicals.

Complications: As the list of chemicals grew, the problems of the truckers became correspondingly more complicated. Chemicals create a great diversity of difficulties. Unlike petroleum, they can't all be hauled in the same type of tank. Equipment, too, must be specially adapted for almost every chemical, and in most cases can't be interchanged—because of variations in required linings, valves, temperatures, etc. Thus a tank constructed for formaldehyde, for example, can't be used for tetraethyl lead.

However, the very fact that there is enough traffic in special products to justify the cost of special equipment is a good indication of the volume of business handled. Tank trucks can now carry commodities that must be pressurized, such as propane; they can also handle liquids that must be moved at temperatures ranging from 18 degrees below zero to 600 F.

For long hauls, railroads remain the most practical method, but trucks have proved superior for shorter trips, say many shippers. On most runs of 200 miles or less, a tank car may have a turn-around time of 8 or 10 days. By comparison, a truck can do the job in perhaps 12 hours. Another truck time saver: door-to-door service.

All Plastic: New developments in materials are also contributing to the growing traffic in tank trucks. A molded plastic tank (*CW, Aug. 29*) 3,600 lbs. lighter than the steel tank it replaces, is now hauling formaldehyde between Springfield, Mass., and Montreal, Can.

The plastic tank is not covered by the new regulations; operating under an ICC special "novel" tank permit, it's being tested under commercial conditions. According to the maker, however, it's only a matter of time and testing before this development, too, as an advance in trucking, will have a place in the ICC rules.

•

Ammonia Fertilizer: The Stanley-Fogarty Co., Hayti, Mo., is engineering installation of an anhydrous ammonia fertilizer plant. Site of the operation: the old Howe Grain and Merchantile's property at Howe, Tex.

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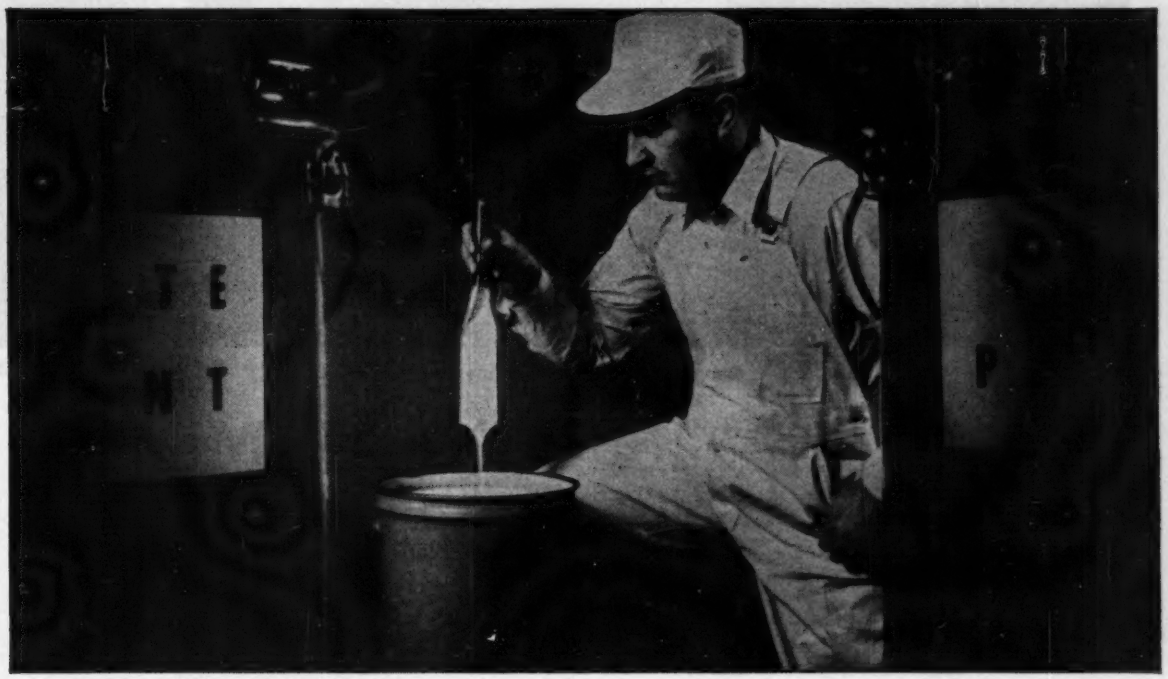

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PARTICIPATION: Important to be a part of progress.

LEADERSHIP

Morale: All Things to All Men

How do morale and incentive practices shape up for chemical process industries researchers? What are the chief morale problems facing research directors? How are they met?

Here are up-to-the-minute answers gleaned from a nationwide survey of chemical research directors.

Money isn't outmoded; but it has lost considerable stock with management men who once viewed the dollar as a cure-all for staff morale and incentive problems. Among research administrators, in particular, you hear less and less of the once classic, "We pay them well, don't worry about their happiness."

The facts, underscored by a just-completed CHEMICAL WEEK survey, prove that research directors do worry about the happiness of their staffs, are constantly on the alert for ways to boost morale. It's also clear that contentment means different things to different people. There just isn't any slick formula for guaranteeing a high level of occupational morale in a given research group.

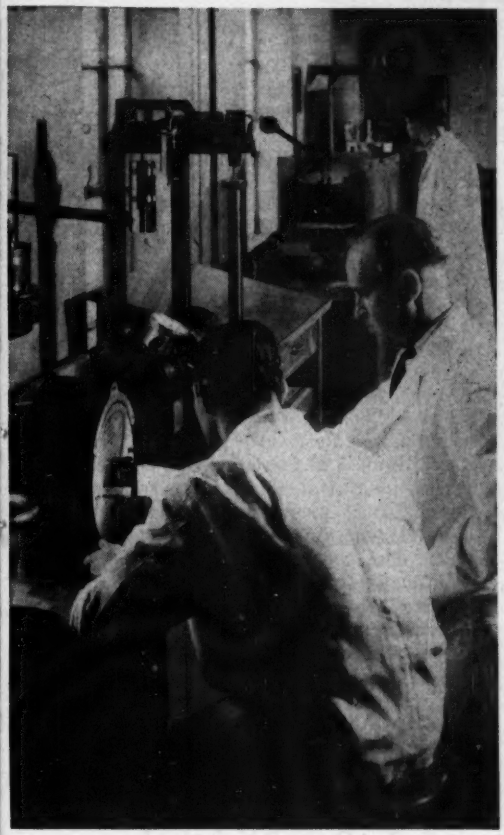
Each case requires special attention to a covey of vital factors. Remuneration, despite the growing awareness of less tangible needs, is still the foundation of the morale structure. It can't insure good results, but—wisely administered—it will serve as the basis for a sound morale-building program.

First requisite to a fair system of compensation, is a periodic salary review. The overwhelming majority of companies surveyed review researchers' salaries at intervals of six months or a year. A few (about 5%) use a sliding standard, check some salaries every six months, others every year. A small minority operate on a quarterly or four-month review basis, and firms that have a monthly system are few and far between (only two among participants in this survey).

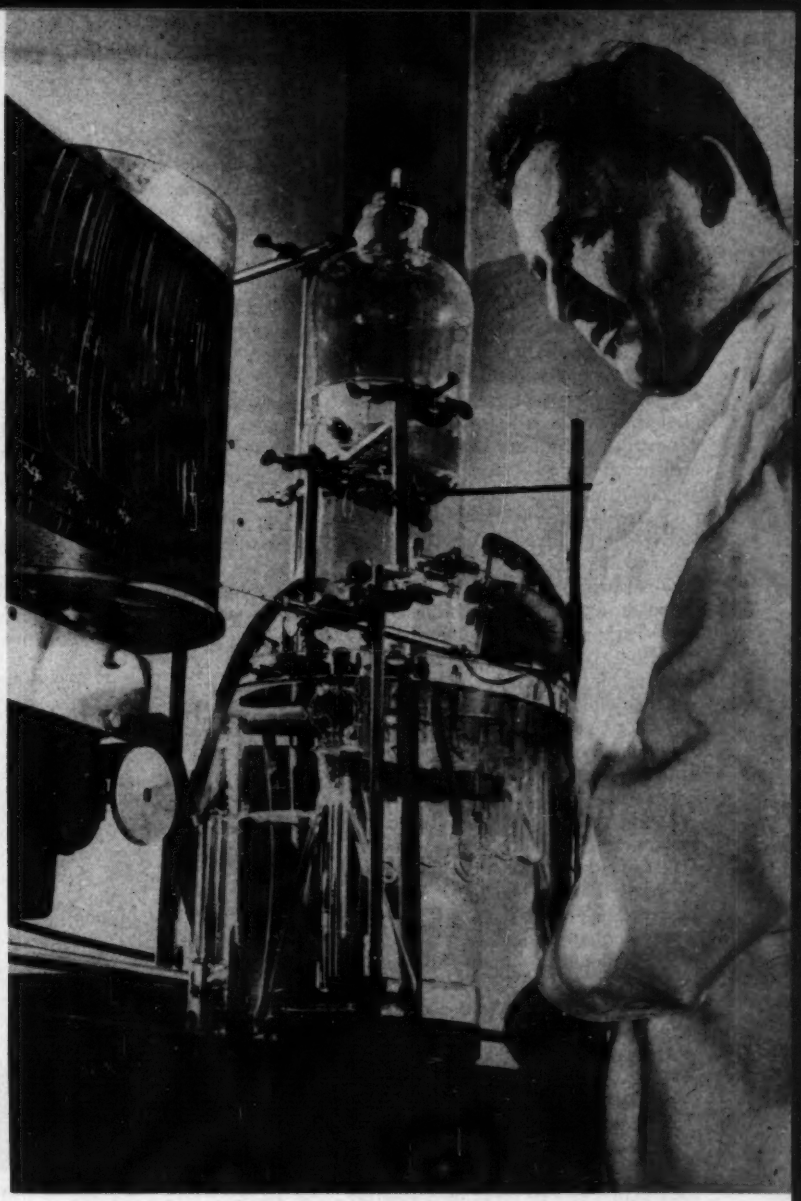
Most companies reporting (53%) review salaries semiannually. In general, frequency of review increases with the size of the research organization. Only one replying firm lacks a formal salary review program, considers increases only when requested by individual staff members.

What do research directors look for in a candidate for a raise? Usually, nothing very startling. Performance, initiative, ability to get along with co-researchers, length of service are universal criteria. Also mentioned: ability to come up with original ideas; professional growth; potential for advancement; capacity to work independently; willingness to assume responsibility. Frequently many of these points are incorporated under the broad heading of "merit." Generally considered separately are cost of living, competitors' salary rates, and financial requirements of the individual.

As a general rule, automatic increases (except for new staffers) are not viewed with favor. However, practically every company participating in the survey acts on the theory that the value of a researcher generally mounts with increasing length of service.



Needed are competence, imagination.



WORK: Keep it challenging.

Of course, promotion as a basis for salary increases is something else, entirely. All of the factors noted above are listed as essential for advancement; and a healthy majority of respondents also want to see a definite inclination for administrative work. But—and this is surprising—a sizable proportion of survey replies ignore personality factors in blueprinting advancement criteria. Less than half, in fact, cite such characteristics as "cooperativeness, facility in human relations, ability to handle people, ability to work with others, etc."

Solid on Leadership: Despite seeming differences in promotion standards, companies surveyed were almost solid in underscoring the importance of competent, imaginative leadership to the morale of research groups. Several firms, moreover, are concerned with another phase of the promotion picture. It's neatly summed up by one harried research director in the admission that his chief morale problem is to "find more adequate ways to prove to personnel that competent researchers do not have to become supervisors in order to have recognition, prestige and satisfactory compensation."

Recognition and prestige are definitely the key words, and they effectively set the pace for much of the morale and incentive-building effort. Publication of research papers, an effective means of promoting both recognition and prestige, is encouraged almost without exception. Only usual stipulation provides that the company is first protected by patents or applications. Narrowest attitude, conspicuous as a sore thumb, is that of the firm reporting that it allows publication only when it will promote sales of company products.

Liberal policies also hold sway over attendance at scientific meetings. Most firms permit all senior researchers to attend any meetings of their choice, at company expense. In addition, most firms encourage all technical personnel to participate (on an expense-paid rotating basis) in local and national meetings of their technical societies. Once every two years at company expense is par for the average researcher, though survey returns show that for a significant proportion of researchers the figure is once a year. Authors of papers for presentation before professional groups receive top priority. And staffers who want to pay their own way generally can get time off to attend meetings.

Tangible Rewards: Recognition of a more tangible nature is common practice as a means of rewarding outstanding achievement. Salary boosts, cash and stock bonuses are the usual forms for such rewards. Profit-sharing systems are not unusual, and one firm throws "recognition parties."

Ranking with prestige and recogni-

tion on the morale scale are working conditions. Modern, well-equipped laboratories have obvious uplift value. But administrative procedures often are more important. Subscribing to the principle that an interested researcher is a good researcher, more than 80% of the research directors surveyed take the individual's work preference into account when assigning projects. And 46% give researchers some degree of freedom in their choice of assignments; a handful of companies permit research people to devote a portion (usually 10% or 15%) of their working time to original projects.

Even those firms that do not allow any freedom of work selection, often give researchers wide berth in formulating an attack on a scientific objective. Perhaps the most liberal policy in effect is that described by the director of research for a large firm. He explains: "We are particularly careful to give a choice on the first assignment. Later [too] we see that no one is working on a problem that is not to his liking."

Products of the industrial research system, research directors queried by CW have some pretty definite ideas on what it takes to keep researchers happy. The consensus:

- Adequate salary.
- Challenging and compatible work.
- Sense of participation in company progress.
- Opportunity for advancement.
- Recognition for a good job.
- Imaginative leadership.
- Treatment as an individual.
- Good facilities.
- Frequent discussion of progress with management, ways of correcting errors, doing a better job.

New High for Hormones

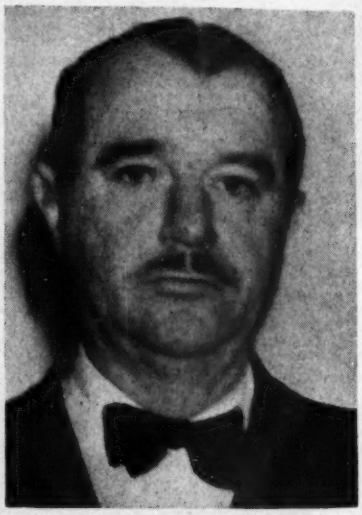
A team of Cornell University Medical College chemists, led by Vincent du Vigneaud, has conquered one of science's loftiest peaks. Capping a painstaking and protracted research effort, the Cornell chemists have scored the first successful synthesis of a polypeptide hormone.

The historic hormone: oxytocin, a pituitary factor that promctes lactation and uterine contraction.

Immediate significance of the dazzling new achievement is limited by oxytocin's modest niche in clinical and veterinary medicine. But, over the long haul, the work should prove invaluable in elucidating the biochemistry and pharmacology of the pituitary gland. More important from an industrial standpoint, it opens the door to the synthesis of other therapeutic polypeptide hormones,* should spark a probe for potent new synthetic modifications of oxytocin.

By means of astute structural sleuthing, du Vigneaud's researchers pinpointed eight amino acids—glycine cystine, proline, tyrosine, leucine, isoleucine, aspartic and glutamic acids—in the oxytocin molecule. With the tenacity of jigsaw puzzlers, the Cornell chemists pieced together the right combination of amino acids—no mean feat in view of the more than 500,000 possibilities.

The synthetic material, a five-amino acid ring with a three-amino acid side chain, was identical to the natural hormone in chemical and physical properties. Moreover, synthetic oxytocin proved fully effective in



DU VIGNEAUD: Polypeptides, over the hump.

stimulating human lactation and childbirth labor.

For du Vigneaud, the oxytocin synthesis is the zenith of more than 20 years of research on pituitary hormones. Since 1932, the world renowned biochemist has concentrated on the extraction, purification, characterization and synthesis of posterior pituitary hormones. His next attempt: the synthesis of vasopressin, antidiuretic and blood pressure boosting hormone.

•

Branching Out: Upgrading of trona products to fine chemicals is taking American Potash & Chemical Corp. (Los Angeles) along new research paths. As the first step in the field of organic boron compounds, the firm has probed a series of borate esters, is now releasing them in laboratory quantities. Potential applications: in organic synthesis; as special solvents, adhesion promoters, heat transfer media, and fire retardants for plastics. Also under scrutiny: mixed boron anhydrides.

•

Charting the Course: Problems in resources research is the special concern of a new steering committee set up by Resources for the Future, Inc. (Washington, D.C.) to guide the Mid-Century Conference on Resources for the Future. Headed by Arthur D. Little, Inc.'s Earl Stevenson, the neophyte group will consider ways of strengthening the nation's resources research, speeding utilization of results. The idea, according to the Washington organization, is to emphasize "the vital role that balanced, effective research can play in offsetting or alleviating many resource shortages."

•

Free for All: U.S.Patent 2,344,229, relating to the use of lysine in the fortification of bread and cereal foods normally deficient in the amino acid, has been released for public use by the Du Pont Co. Available for royalty-free licensing, the patent was recently purchased by Du Pont from C. M. Armstrong, Inc. (subsidiary of American Maize Products). Du Pont is currently pilot-planting lysine, distributing the amino acid in experimental quantities.

•

Fuel First: To Wyandotte Chemicals Corp. (Wyandotte, Mich.) goes the distinction of having played host to the nation's first conference on rocket monofuels. Sponsored jointly by Wyandotte and U.S. Navy, it was attended by 47 American and British industry and government rocket experts. Monofuels, unlike conventional rocket propellants, require no oxidizer, simplify problems of fuel storage, pumping and ignition.

•

Germicide Hopefuls: Glycerol and glycol ethers are providing new antimicrobial candidates. Researchers of Wallace Laboratories (New Brunswick, N.J.) prepared several substituted phenolic ethers of glycerol, propylene glycol and trimethylene glycol, tested them for antimicrobial activity. Results: trimethylene glycol ethers are the best germicides, but irritating to the skin; propylene glycol ethers have considerable antifungus activity, are less irritating; in general, 4-chloro-3,5-dimethyl phenoxy ethers showed greatest activity.

* ACTH and insulin are two. More complicated than oxytocin, both are still well beyond the range of synthetic organic chemistry.

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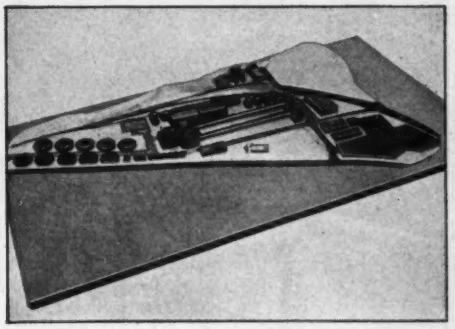

THIS MODEL of the Foote Mineral Company's project at Sunbright, Va. was used as a visual aid in planning the functional arrangement of buildings, material flow, accessibility and utility service distribution... Visual aid early in the planning saves the customer many engineering dollars.

The productive capacity of the entire lithium chemical industry will be *doubled* when this new plant at Sunbright, Va. goes "on stream." Its output will enable Foote Mineral Company to satisfy the unprecedented demand for lithium chemicals as basic ingredients in multi-purpose greases, welding rod coatings, ceramics, air conditioning, TV glass, porcelain enamels and many other industrial products. From original plans, through layout, engineering, procurement and construction of this unique plant, Blaw-Knox worked in close harmony with Foote personnel. Every phase of the work proceeded according to plan, effecting numerous economies.

This Blaw-Knox project is but one of the many different chemical and process plants engineered and constructed by Chemical Plants Division—behind each of which go years of background experience applied to today's competitive situations and technological advances. If you are thinking of new or improved facilities, a discussion may prove profitable to you.

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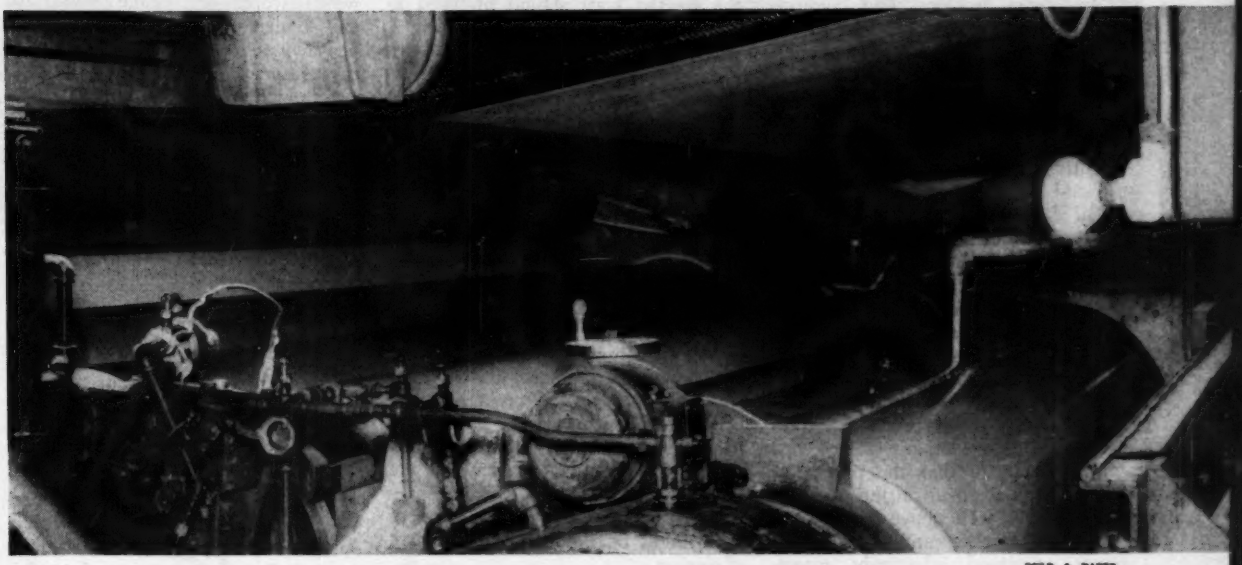

PULP & PAPER

COATING ROLLS: For verminproof papers, synergised pyrethrins.

Insecticide Armor

Food and grain packaging papers, treated to repell and kill insects, could be a wide-open market for synergised pyrethrins.

Flour bags, paper boxcar liners have shown up well, but still untouched are opportunities in consumer packages for cereals, premixed foods.

Treated kraft papers are currently marketed by several firms, but there's been no real promotion of them. Consumer education programs might benefit paper, insecticide makers.

Whether it's in the bags of grass seed you used last weekend to rebuild your lawn, or in the breakfast food package you may buy next year, chances are you're going to get more familiar with use of synergised pyrethrins insecticides in packaging materials.

Already bagged in insecticide-treated paper multiwalls are flours and grains for shipment to humid tropical and semitropical areas. And currently available from several manufacturers is treated kraft stock. At least seven paper mills have experimented with the verminproof papers, and St. Regis Paper Co., for one, has offered the kraft commercially since 1947.

But still virtually untouched is the market for the papers in packaging consumer products like cake mixes, cereals, and dried fruits. One study of insect infestation showed that an average of 8.4% of hot-roll mix packages were infested by insects over a period of a year, with infestations as high as 14-19% in August and September—which indicates that present packages are far from perfect.

Something to Sell: It's no secret that much of the work on the use of synergised pyrethrins on papers has been prodded by a firm with just such an insecticide to sell. U. S. Industrial Chemicals, looking for markets for its piperonyl butoxide-pyrethrins mix called Pyrenone, is offering assistance to firms interested in trying to make verminproof papers.

It won't truly have an outlet, though, until consumers demand the bugproof packs—and it will take a lot of consumer education to make the housewife realize that such packaging material exists, and to spur her to demand it. Currently, most food and grain packagers feel they have adequate materials in the paper and bags they buy.

Most surveys show that the major portion of the infestation occurs not at the packaging mills, but on the dealers' shelves, or in the consumers pantry.

Coating Additive: Insectproof papers and packaging wraps have been an objective for some time. During World War II, such products were made, but their cost prohibited their use in postwar consumer applications. And during the war, workers in England tried to make verminproof packaging with DDT. Top drawback of DDT was that it tended to migrate from the paper to the package's contents.

Insect repellents like ammonium chloride were also investigated, but they sometimes tended to deliquesce, and the absorbed moisture damaged the contents. Wax coating helped in some cases, but was not universally satisfactory.

The biggest forward step was the development of synergised pyrethrins, which are both repellents and insecticides. The synergist lowered the cost of the expensive natural insecticide to the point where it could be considered for packaging use. A typical paper employs about 50 mg. of a synergist like piperonyl butoxide or other commercial synergist and 5 mg. pryethrins per square foot. This works out to about ⅓ lb. synergist and 1/30 lb. pyrethrins for a ream of paper.

Use of such a mixture considerably boosts paper price—St. Regis sells regular 60-lb. kraft stock for $160/ton; asks $450 for treated paper. In its multiwall paper bags, treating boosts price $27.55/1,000 bags of 100 lb. capacity.

Insecticide can be put in the paper

in two ways or more. One common method consists of adding the insecticide at the sizing press (*see cut*); another system calls for addition of the insecticide in a slurry applied to the paper after it has been made—it is sprayed on and dried. Color, ink retention, and glueability of the paper are said to be unaffected.

Oil Carrier: USI has been selling its Pyrenone in oil concentrates, or in emulsifiable form for the coating processes. Where it is desirable to treat paper other than kraft, wax-carriers can be used. Cellophane, for example, can be coated with a Pyrenone-bearing wax, although it has not yet been possible to include the insecticide in the waterproofing lacquer for the cellulose film.

Tests indicate that the pyrethrins and synergists remain in the paper at temperatures well above 150 F. In typical packaging applications, the paper remained effectively insect-repellent for a year or more.

Although there is little hazard should pyrethrins migrate from the wrapping paper to its contents, the Food and Drug Administration says the treated kraft should be used in the outer layer of multiwall packages. Particularly developed for use with these special multiwalls are pyrethrins-bearing inks, adhesives, and even thread for sewing the bags.

Heavy kraft treated with these insecticides is effective against flour beetles, cadelles, meal moths, and a variety of other insects. In addition to application in multiwall bags, such papers have been used to line boxcars that are to be used for grain carriers; the liner kills the pests that have lodged in the crevices of the cars.

Box Dressing: Use of treated paper and cardboard is one of the simplest ways of making a bugproof box, but several other approaches have been tried. One maker of premixed foods developed a method of spraying the sealed package with a pyrethrin mix ture. Tests indicate that such a procedure might be confined to the points of closure.

A number of products might well be profitably packaged in insectproof packages, packages other than expensive heavy glass or metal containers. It's possible, too, that treated paper, which would discourage silver fish and similar pests, could be sold to housewives for storing garments over the winter.

But such papers will never be produced until the housewife demands them—until she knows how readily the items she buys can be made insectproof. It would take a consumer educational program, but it could mean a good market for insecticides, and for paper, too.

Cool-Fusing Frit

READY FOR THE OVEN is new decorative hollow ware developed by Cleveland artist Edward Winter.

The gift items are unique in that they are formed of aluminum. Low-fusion porcelain enamel frits worked out by Du Pont permit the use of the lightweight metal. These frits, available in a wide variety of colors, fuse at about 1000 F, which is a safe 100 degrees below the temperatures at which aluminum deforms. Heretofore, steel and copper were the only permissible base metals.

The new hollow ware is lighter, cheaper than previously produced products, and the fused coating is corrosion resistant—can even be dropped without damage.

Tire Brightener

Warming up for introduction within weeks is a new auto specialty, Bleche-Wite. The product, made by Westley Industries (Cleveland), is claimed to be a brand new development in white side-wall tire cleaners.

It's simply sprayed on the dry tire, Westley says, then wiped off with a damp cloth or sponge. No scouring is needed. Exactly what goes into this formulation, which is said "to make obsolete" all other cleaners, Westley refuses to say, other than that it's a combination of detergents, emulsifiers, and a bleach with "penetrating and wetting" qualities. No caustics, acids, or abrasives are in it.

Packaging of the new cleaner has some novel twists, too. It's to be put out like window cleaner—in a 16-oz. metal container with a sprayer included. Suggested retail price for the can—one will clean up to 24 tires—is $1, and it's to be sold through auto parts dealers, service stations, hardware stores, and the like.

In addition to the retail outlets, Westley plans to sell 1 to 55 gallon containers to car dealers and other bulk users.

Westley is a young firm, started in 1948. Its major product has been a silicone auto polish, and it feels its success with the polish is good reason to expand its line. Secret of its success, Westley claims, is low overhead—equipment it made itself, and no advertising except point-of-display cards.

•

Standards Check: With an eye on the number of sub-SAE-standard brake fluids now being sold (*CW, Aug. 8*) and the complexity of laws that confuse fluid makers, Foster D. Snell, Inc., is now promoting new services it offers these manufacturers. Snell will test products to determine if they are up to the oft-changing SAE minimums and state laws, and provide suitable formulations in cases where the fluids aren't up to snuff.

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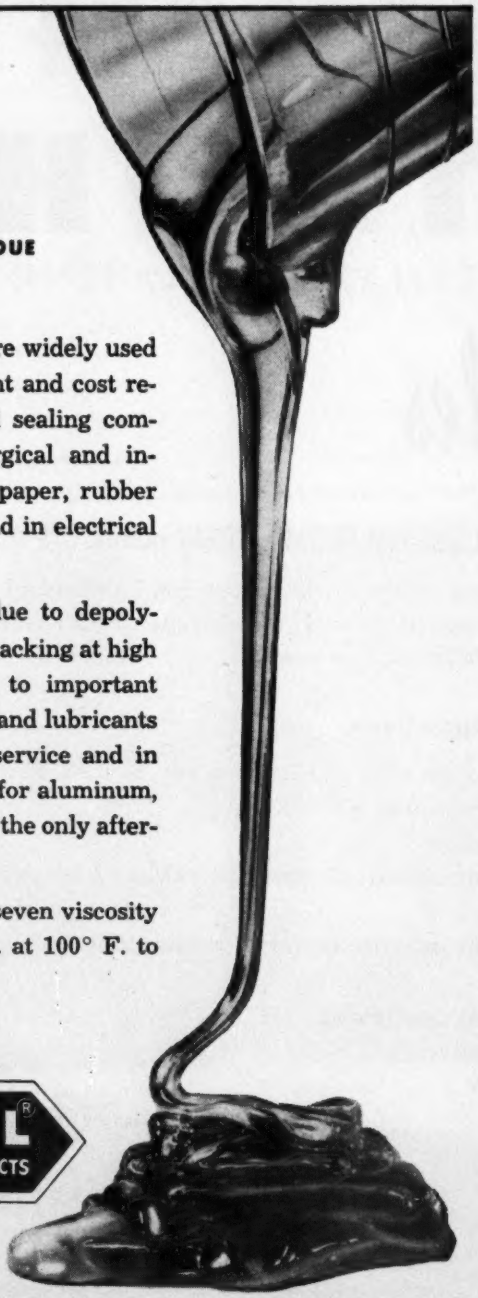

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Newdet

Underlining the growing market for sudlessness (CW, Sept. 19), Universal Detergents, Inc. (Los Angeles) last week began full-scale commercial production of its new low-sudsing detergent, Udex. Billie Bryant, Universal Detergents' peppery general manager, quite frankly admits that he hopes to ride the coattails of the intensive promotional campaign currently under way in behalf of Monsanto's All.

Udex is a 90-95% active free-flowing alkyl aryl sodium sulfonate. As initially produced, Udex is a 50% active liquid, easily drum- or spray-dried to give the active powder. Right now, Udex has one drawback that might limit its sales to housewives—it's light tan in color, and it has long been axiomatic that only pure white wash products will sell.* Consequently, Udex will be pushed chiefly for the industrial cleaning market.

On the plus side, though, Bryant says, are such factors as the ease of blending with builders, stability in alkaline solutions to a pH of 11.5, and ready solubility in water, nitric, phosphoric, acetic and hydrofluoric acids (a suspension forms in sulfuric). In carload lots, Udex powder sells for 25¢/lb.; as liquid, 7½¢/lb.

Universal Detergents (a Texas corporation) was formed early in 1952. It acquired a small refinery lying idle in the shadow of Signal Hill, heart of the Los Angeles oil producing district, and immediately began pilot-plant work on its process (developed by independent inventor J. Ward Putt). Starting early this year the plant was slowly scaled up to its present capacity of 25 tons/day. Careful evaluation of every move has kept total investment to date slightly below $1 million.

The Putt process takes low-cost petroleum cuts (such as extracts from the sulfur dioxide treatment of cracked gas oil and kerosene) and converts them to specific aromatic hydrocarbons, using fractions of these aromatics as feed stocks for production of a wide range of hydrocarbons including anthracene and phenanthrene.† Patents have been filed on one specific application of the process: production of detergents. Developmental work is being pushed; eventually, anthraquinone will be one of Universal Detergents' major products. At the present time, however, the company has its hands full getting its detergents in the black.

Step Saver: Key to the process is

* P&G's Blue Cheer seems to belie this rule, however.

† Production of the feed stocks is covered by U.S. Patent No. 2,207,552.

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the fact that Universal Detergents can alkylate and sulfonate in one step. While other producers try to isolate a pure product, Universal comes up with a mixture of alkyls, which the company claims does a better job in many applications than would a pure compound. The company has in mind establishing sulfonating plants throughout the country, shipping feed stock from its Signal Hill plant.

By changing the feed stock slightly and varying operating conditions, Universal can alter the characteristics of its detergents—Udet, for example, is a detergent basically similar to Udex, but with high sudsing qualities. Another product is Udet F, a formulation particularly adapted for use as a wetting agent in fertilizer production. It has the ability to remain in homogeneous suspension in sulfuric acid.

With a highly active material at a low price, Universal Detergents has been able to invade the Eastern market—Berkshire Chemicals, Inc., New York, has recently become distributor of UD's surface-active agents for agricultural chemical use (*CW, Oct. 3*). Here Universal has been fortunate, in that few Eastern makers of less active materials can compete on the Pacific coast.

Fast-growing, and proving that a small firm can succeed in spite of hard competition from much larger manufacturers, Universal is just beginning to uncover its markets. And growth should be stimulated when UD works out production of the pure white detergents home consumers seem to favor.

•

Binder: Available now in small quantity for test purposes is a new pressure-sensitive glue for binding Teflon to Teflon, or Teflon to stainless steel. Flexrock Co. (Philadelphia) is making the new product, Flexrock 380, and claims it has a peel strength of over 1,000 gr./in., a direct pull strength of 12-15 psi. Glue is applied by brushing, dipping or spraying; glue is permitted to dry before parts are joined. Heating for five minutes at 300 F is said to give greater bond strength.

•

Add Another Additive: Frontier Refining Co., selling its gasolines in the Cheyenne, Wyo., area, is now touting a new gasoline additive. Though its chemical composition is undisclosed, it is claimed to alter combustion deposits, and, like Shell's TCP, to add 15% more power, 15% greater mileage, and 150% longer sparkplug life.

And more important to Frontier dealers is the fact that it has added

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O-Cedar Expands: Business seems to be booming for the O-Cedar subsidiary of American-Marietta Co. The firm plans a $600,000 addition to its Chicago plant to boost output of household products.

•

Test Town: In a novel promotion scheme, Rubberseal Corp. (Woodside, Long Island, N. Y.) has offered to provide its new puncture-sealing compound to every auto owner in Massapequa, L. I., to prove the value of the new product. Rubberseal is composed of tiny particles of rubber in a jelly-like vegetable base. It is injected directly into the tire under 100 lbs./sq. in. pressure. It is claimed to last the life of the tire.

•

Pack Trick: A new twist on paint brush cleaner packaging has been worked out by the Klean-Strip Co., Inc. (Memphis, Tenn.). A large-mouth can contains a wire-brush support so that paint from the brushes settles to bottom of the can, out of reach of the bristles. The cleaner is an emulsifying type, claimed to remove any paint, varnish or shellac.

•

Cooler Drier: The Davison Chemical Corp. is now selling a new refrigerant desiccant, PA-400, claims it's the most efficient silica gel desiccant yet developed for refrigerant systems.

•

More Glue: Adhesives production capacity of the H. B. Fuller Co. plant in Buffalo has been doubled with the installation of new processing equipment.

•

Preserving Time: Koppers Inc. has set next July as tentative starting date of operations at its new wood preserving plant in Elmira, N. Y.

•

Inside Info: Add a new use for cellulose synthetic sponges. General Mills' O-Cel-O Div. is introducing a sponge especially made for surgical applications; they're claimed to be far more absorbent than previously used cotton gauze sponges. Too, they can be rinsed out and reused during the operation and they are claimed to be 10 times more effective sorbers than gauze.

•

Mudge No More: Chemical Products Corp., East Providence, R.I., has purchased from Stoner-Mudge, Inc., Pittsburgh, all its formulas, procedures, and some equipment for manufacturing plastisol.

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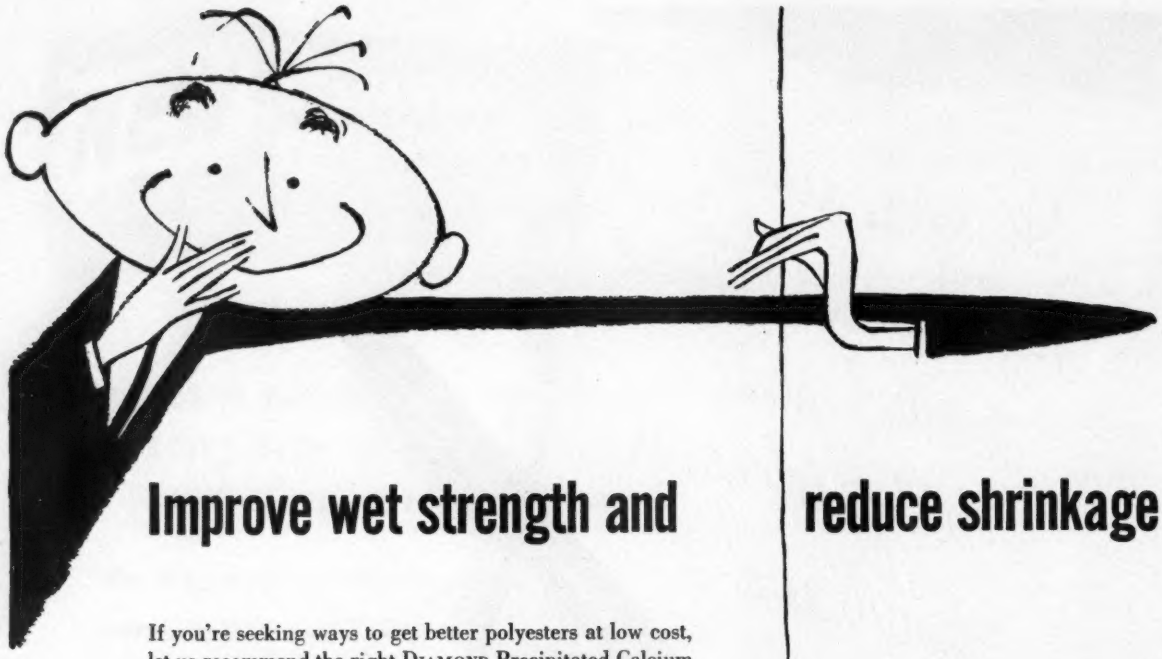

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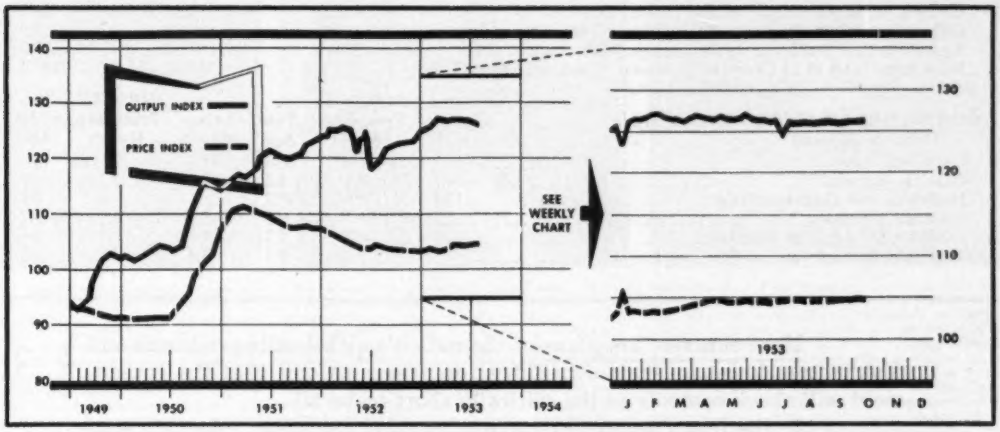


CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

Most industrial chemical sellers this week are getting ready to hustle contract orders for next year's business. But at least one alkali maker—jumping the contract-writing season by several weeks—already has its salesmen in the field.

Tonnage products for delivery in 1954, for the most part, bear the same price tags in effect now. Reason: schedules for practically all heavy chemicals have been revised upward over the past few months, and sellers are shrewdly reluctant to hit customers with higher prices so soon after.

That's no guarantee, of course, that prices will not be altered during the coming year. Chances are, though, no drastic changes will occur before the second quarter.

•

Soda ash, at the moment, is being labeled as just about in balance. If anything, it may actually be leaning a little toward the long side. Chemical, glass, paper, other major consuming industries have been maintaining a steady rate of contract withdrawals, but there are indications of a slight easing in take bobbing up this month.

On the other hand, caustic soda is on the long side. Cutbacks in production by several large producers, however, are preventing any semblance of a market glut.

•

There's definitely no backup in tricresyl phosphate supply, though. Consumption by Shell plus that company's recent licensing of Continental Oil to help blanket the country with TCP-needled gasoline outlets is pressuring tricresyl makers to up production—as previously indicated here (CW Market Letter, Sept. 19).

Most significant development is Monsanto's just-completed production changes that will increase its TCP output more than 80%. Montrose Chemical, too, has stepped up production about 30%. And while Ohio-Apex is eyeing the brighter demand, it's reported that Celanese officials are mulling over plans for a completely new TCP plant.

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	126.2	126.4	122.3
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.8	104.8	102.4
Bituminous Coal Production (daily average, 1,000 tons)	1,538.0	1,610.0	1,518.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	249.3	246.0	240.7

MONTHLY INDICATORS—Foreign Trade (Million Dollars)	EXPORTS Latest Month	EXPORTS Preceding Month	EXPORTS Year Ago	IMPORTS Latest Month	IMPORTS Preceding Month	IMPORTS Year Ago
Chemicals, total	65.7	70.4	60.3	22.1	26.5	15.1
Coal tar products	4.7	4.4	3.3	4.3	3.2	3.9
Medicinals and pharmaceuticals	17.4	18.9	16.2	.5	.6	0.7
Industrial chemicals	9.7	10.1	9.5	6.4	7.5	3.2
Fertilizer and fertilizer materials	3.3	3.7	4.1	8.2	11.9	6.6
Vegetable Oils and fats, inedible	7.3	1.4	3.1	8.8	8.2	6.5

More concrete are plans of the nation's nickel salts producers and distributors to set up their own allocation programs now that the government will shuck controls on the critically short material.

In the first decontrolling move for other than the "adequate supplies" reason, the recently set up Business and Defense Services Administration (successor to the abolished National Production Authority) last week announced removal of use and distribution bans effective Nov. 1.

The action swings the agency into line with industry thinking that government restrictions do not ease the situation—have indeed contributed to the hardship of many small businesses.

•

There'll be no pinch on methanol users, though, when output from Commercial Solvents' expanded Sterlington (La.) ammonia-methanol plant begins to hit the market. The company has sunk $20 million into stepped-up facilities there, thus eases into top spot as the country's largest producer-seller of methanol.

Rated capacity to be revealed at next week's elaborate dedication ceremonies: 30 million gals./year.

•

A drastic drop in exports is behind U.S. textile makers' agitation for a renegotiation of the Torquay tariff agreement. Opposed since its inception (1951), the agreement is being blamed for the loss of more than 56 million sq. yds. of cotton and rayon export business between this country and Cuba since that time.

Sparking the current—and continuing—howl for a change is the Textile Export Assn. of the United States. A before-and-after-Torquay picture of shipments to Cuba—once third most important foreign market for U.S. textiles—is the association's latest bolster for its revision argument.

•

Interest in export markets for now-sluggish U.S. insecticides is highlighted by the recent scramble for a United Nations' order of 1,000,000 lbs. of 75% DDT. Prices quoted on the material—which will be used in the Far East and South America—were highly competitive, ranged from a little over 21¢ to a shade less than 29½¢/lb.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending Oct. 12, 1953

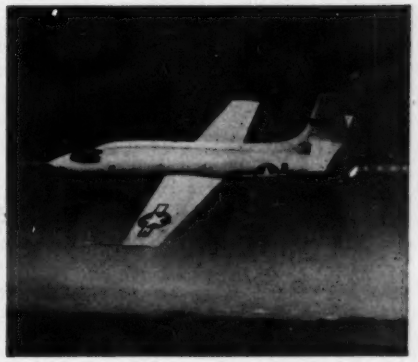
UP

	Change	New Price		Change	New Price
Black Acetylene, bgs., c.l., wks.	$ .01	$ .17	Chlorinated paraffin, 42pc, drms., c.l., frt., alld.	$ .015	$ .155
Anethole, tech., c.l., f.o.b. Southern ship. points	.20	.75	Crude cottonseed oil, tanks, & southeast	.0025	.13375

All prices per pound unless quantity is stated.

The Santa Fe's "Chief" and "Super Chief" operate under conditions of high speed and excessive heat. Electric motors develop such heat that ordinary insulation would swell or burst and cause the rotors to "freeze" in the mounting. By impregnating these rotors with protective resins under high vacuum in Stokes Impregnators, each turn of wire is held rigidly in place and the motors operate without interruption. Vacuum impregnation also helps in making lace and rugs, metal castings and electrical parts, abrasive wheels and oilless bearings, water-proofed paper and cloth, and many other common products. Send for descriptive and illustrated brochure on "Vacuum Impregnation."

Every woman can now adorn herself with costume jewelry—and handsome pieces, too—at very low cost. By metallizing the surface under high vacuum, low-cost metal and plastic pieces take on the glistening brilliance of silver, gold or rhodium. No buffing or finishing operations are necessary. Stokes Vacuum Metallizers are used to give this brilliant metallic finish to hundreds of automotive and electrical appliance parts. Beauty and salability are enhanced. Many industrial products—capacitors, reflectors, lenses, instruments, to name a few—gain functional value by vacuum metallizing. We shall be glad to send an interesting and informative brochure, "Vacuum Metallizing Today."



Many airplanes of the future will take advantage of the high strength-weight ratio of titanium. It is a plentiful metal, spurns most corrosives which affect other metals, and endures extraordinary heat. Unfortunately, during some stages of production titanium has an incorrigible affinity for other elements . . . it wants to be anything but pure titanium. Part of the processing of ore to metal must therefore be carried out in vacuum. Stokes Vacuum Furnaces are designed for this purpose. Zirconium and hafnium are other metals long known to science as laboratory curiosities but of little practical value because they could not be smelted or refined to practical purity. Now they become useful as scientists process them under conditions of high vacuum. Write for the latest bulletin on Stokes Vacuum Furnaces.

Why is the sailor so happy? A grievous injury to his leg, which until recently, would have demanded amputation, was repaired with human bone preserved by freeze-drying under vacuum. After physical and medical therapy the sailor will walk normally again. The process of preserving human bone in this way for storage in the tissue bank is carried out in Stokes Freeze-Drying equipment. The new technique was developed by staff officers at the U. S. Naval Medical Center, Bethesda, Maryland, in collaboration with members of the Stokes organization. Freeze-drying in vacuum is also essential to the preservation of blood plasma and some biologicals, and to the preparation of many of today's "wonder drugs," including ACTH and cortisone. Send for an informative booklet on "Vacuum Freeze-Drying."

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. . . or should there be?

Many industries use vacuum now. Many more need vacuum to develop new or better products, or to improve current methods.

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Stokes techniques of building vacuum processing equipment for production in commercial quantities have been developed during fifty years in vacuum engineering. Stokes is FIRST in vacuum.

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Now—Monsanto Unitizes Phthalic Anhydride

Man-hours for unloading cut 67%

UNITIZING is Monsanto's method for speeding the handling of phthalic anyhdride. It consists of stacking eighty-pound bags on expendable *paperboard bases*. Bags are glued together to form one-ton units. Each ton unit can be raised by fork truck and quickly moved from boxcar to unloading dock.

For further information call your nearest Monsanto sales office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 800 N. Twelfth Blvd., St. Louis 1, Mo.

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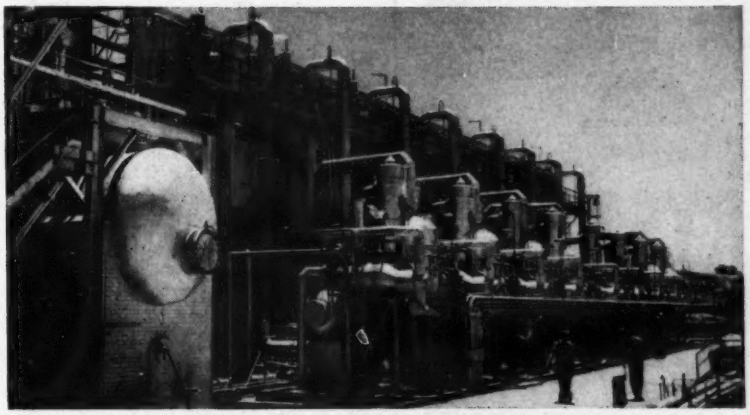
QUICK UNLOADING tests during trial shipments have shown a 55% saving in time and a 33% saving in the number of men unloading a 40,000-pound car. In a typical case man-hour savings were 67%.

EASY HANDLING . . . you can move a ton of phthalic anhydride at a time by fork truck and eliminate manual handling of individual bags during unloading.

BETTER WAREHOUSING . . . uniform units allow safe, neat stacks. These are easily tiered to permit storing of three tons in an area four feet square.



PHTHALIC PRODUCTION: In chemical synthesis, ortho led, but now all . . .

The Xylenes Step Up

More and more separated xylenes will be available as petro producers vie (with expansions and new plants) for promising polyester fibers, new films and plasticizer markets.

Output of para alone may near a whopping 100 million lbs./year level if Dacron, Mylar, other uses fulfill expectations; and the outpouring has already started.

At long last, the xylenes—least emphasized of the big three aromatics*—are stepping into the chemical markets spotlight. And their rousing entrance can be attributed to news concerning two of the three isomers:

- Para xylene: Beginning of a whopping petroleum-source expansion that may add some 70-80 million lbs. to the nation's capacity by 1955.
- Meta xylene: Anticipated skyrocketing consumption by Oronite Chemical's projected 50 million lbs./year isophthalic acid installation.

Chemical Crack: Xylenes, of course, hit their importance-peak during World War II (*see end-use pattern table*) when large quantities were consumed for aviation gasoline and lacquer solvents. These uses, however, are nonchemical, nonpremium. Only within the past few years have xylene isomers been recognized as profitable chemical building blocks.

First to crack the field was Oronite Chemical with its commercial oxidation of ortho xylene to phthalic anhydride in 1945.

About that time, introduction, in England, of the synthetic fiber Terylene, nudged para into the chemical picture. For para xylene is the precursor of terephthalic acid, one of the fiber's raw materials.

Production of Dacron—Dupont's U.S. version of the British fiber—in 1951, further enhanced the para isomer's chemical standing. And adding more luster was the company's later development of a photographic film base, and the polyester film Mylar. The film base will be turned out commercially in a now a-building plant in Parlin (N.J.); Mylar, in a $10-million Circleville (O.) plant. The new polymers closely resemble Dacron chemically, for all are condensation products of ethylene glycol and terephthalic.

Though Dacron popularity at the moment has been affected by the recent wave of criticism leveled at synthetic fibers in general, most boosters—including current and potential para xylene producers—are convinced the

* For Benzene see *CW, Sept. 6, '52;* Toluene, *CW, May 23, '53.*

Xylenes End-Use Pattern 1945 (Estimated)

Gasoline blends	74%
Protective coatings	20%
Medicinals	0.5%
Adhesives, cements	0.5%
Others	5%

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High-quality Crystal Urea is made by Nitrogen Division to rigid specifications in modern synthetic ammonia plants located at South Point, Ohio and Omaha, Nebraska.

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Also Coming in '54

U. F. Concentrate-85 — The new, highly-concentrated solution of formaldehyde in urea specially designed for use as a raw material in urea-formaldehyde resins and adhesives. Check these advantages:

✓ **Highest commercially available concentration** of liquid formaldehyde — 61% formaldehyde and 24% urea in aqueous solution.
✓ **Increases production** in shorter time in existing equipment.
✓ **Saves storage** and handling costs.
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U. F. CONCENTRATE-85 is now in pre-commercial production. Write for complete details.

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nonacrylic will soon resume its steady once-predicted climb toward the 200 million lbs./year nylon level.

But the fact that Mylar is a film, not a fiber (with textile applications), doesn't make the raw material suppliers unhappy. They look with glee on potential uses for it in electrical (e.g., as a capacitor dielectric), packaging (e.g., collapsible tubing), laminating, and other (even storm windows) applications. These outlets, now in the market-probing stage, are expected to swallow a goodly share of para xylene.

Petro Plunges: These possible burgeoning markets are the lure beckoning a raft of petroleum companies into the para xylene separation arena. Until recently, Oronite has had a clear field as the only commercial producer of the chemically consumed para. But output from Standard of California's West Coast refineries (Richmond, El Segundo, Calif.), will take a 15-fold leap—from 2 million lbs./year in 1952 to an estimated 35 million lbs.—by early next year.

Right now, though, Humble Oil's spanking-new plant at Baytown (Tex.), is producing at more than its designed 25 million lbs./year rate. Humble's decision to plunge into full-scale para production was buttressed by experience gained after about three years pilot-planting that neared a 20,000 lbs./month output.

Trade talk has it that Sun Oil—though the company will neither confirm nor deny it—will swing into benzene, toluene, xylene production at its new Marcus Hook (Pa.) refinery within a month or two, then, about the third quarter of next year, begin turning out the para isomer at a 12-15 million lbs./year-clip.

No speculation, however, it attached to Standard of Indiana's entry into the scramble for the polyester fiber and film market. Its Whiting (Ind.) installation, which will be built to produce some 14 million lbs./year, will go onstream in Jan. '55.

More, But Hesitantly: It's a cinch that until the recent slackening in bustling synthetic fiber demand practically all petro-xylene makers were eyeing possible para production. But Dupont's current, somewhat unsure status as a take-all buyer of para, has effectively braked some enthusiasm.

Sinclair, for instance, while still professing interest in para production, will probably not push its plans until the market situation is clarified. Phillips Petroleum, another company which once eyed the para future with a more than casual interest, has literally shelved its blueprints for the

it's easier to

Keep the Team on the Beam

in the Land of Plenty

A recent *Chemical Week* survey showed that chemical plant managers label personnel problems as a major problem. *"It's a matter of rounding off the sharp edges to keep everyone working on the team, keep each one thinking that this plant, this company is a good place to work,"* said one plant manager.

We'd like to point out something that may seem pretty obvious, but can't be repeated too often: No man will be satisfied with the place where he *works* unless first he's satisfied with the place where he *lives.*

This applies not only to the men who hold down the chemical industry's important administrative, research, engineering, production, sales and shipping jobs, but also to every man on the payroll right down to the guard at the gate. The big reason why "home-rooted" manpower is one of *The Land of Plenty's* biggest industrial advantages is that *The Land of Plenty* has those things which make a man say "This is where I want to live . . . this is where I want to bring up my family."

YES—The Land of Plenty offers clean, progressive towns and cities . . . Traditionally friendly people . . . Good schools, primer through college . . . Excellent, healthful climate . . . A wealth of scenic grandeur . . .

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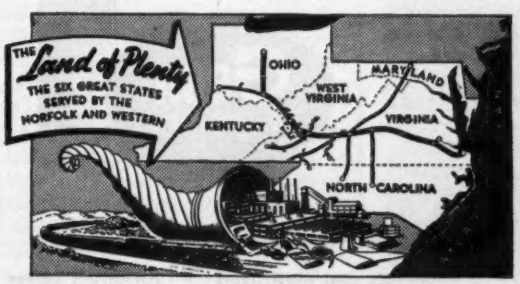

If you're looking for an ideal plant site, don't overlook *The Land of Plenty.* Our plant location specialists will furnish you complete and reliable information on excellent locations, promptly, in confidence and without obligation. Contact: The Industrial and Agricultural Dept., Drawer C-626 (Telephone 4-1451, Ext. 474), Norfolk and Western Railway, Roanoke, Va.

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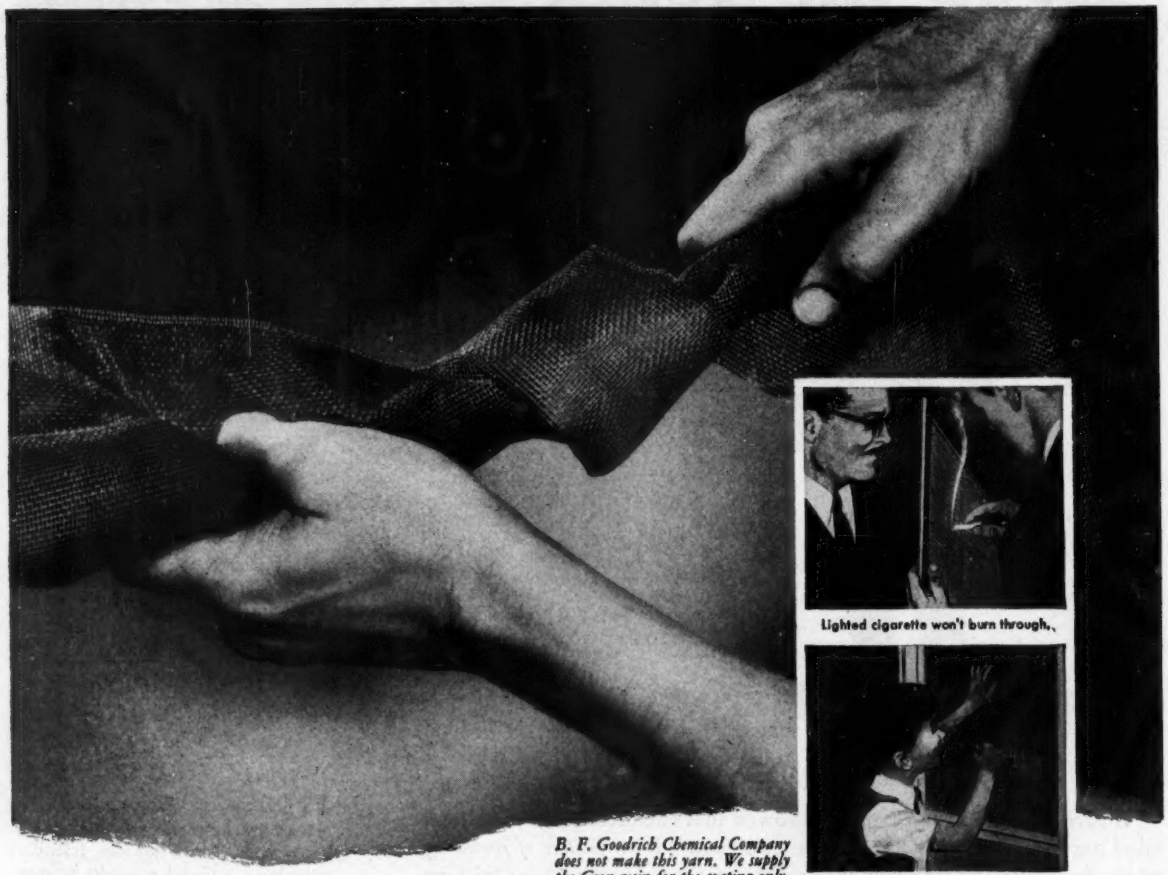
Another new development using

B. F. Goodrich Chemical *raw materials*



B. F. Goodrich Chemical Company does not make this yarn. We supply the Geon resin for the coating only.

Lighted cigarette won't burn through.

Outstanding durability—won't stretch or corrode

Tough Screen made of Armored Glass Threads

Start with fibrous glass yarn, add a manufacturer who knows what Geon vinyl materials can do, and you come up with a new super-tough yarn that's headed for sales stardom—in a new type window screen, for instance!

Glass threads are treated with a formulation of Geon resin. The result: yarn with high tensile strength and abrasion resistance. It is fire and chemical resistant. It can be heat-sealed to vinyl film for extra reinforcement. Name your color—and you can get it.

Window screens woven of this yarn are but one outstanding example, with other uses in the offing.

Geon has a way of sparking good sales ideas. For Geon materials come in a variety of forms to fit so many needs—resin, plastic granules, liquid latex. They can be used for extrusions, molding, casting, coating or dipping. They can make products resistant to heat and cold, wear, oils, greases and many chemicals. Perhaps a Geon material can help you develop or improve products—we'll help with technical advice. Just write Dept. E-11, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

GEON RESINS • GOOD-RITE PLASTICIZERS . . . the ideal team to make products easier, better and more saleable

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nonce. Shell, on the other hand, is said to be working on an improved process for producing para, may enter the race in two or three years.

Although bulk of the current and future para output will likely wind up in Dupont-labelled products, a sizable market for the isomer exists outside the country. Imperial Chemical Industries' new Canadian Terylene plant—due in 1954—is expected to siphon some 5-8 million lbs. of the U.S. para. ICI, too, is licensing other European companies to produce Terylene, and though demand is still a thing of the future, it is logical to assume that made-in-America para will generate some interest there.

But it's the domestic market which harbors some problem-posing supply-demand factors. While Dupont has not as yet cancelled any contracts for para xylene—and no producer will throw up a plant without a firm contract in hand—the big consumer makes no bones about shying away from any more new commitments. All its current requirements are being covered by present sources.

That, of course, raises a perplexing question: Where will all the upcoming para go? And there'll be plenty (*see chart*). By the end of this year Oronite and Humble together will have capacity to make about 65 million lbs./year. Compare that with last year's 8 million. But two years hence, adding capacity of Sun Oil, Standard of Indiana, Shell, and possibly a couple more still undecided oil companies, and you wind up with a para slug that's crowding 100 million lbs./year.

Activities of other chemical companies may also have an impact on the para market. For example, Hercules is turning out respectable quantities of dimethyl terephthalate also aimed at the fiber and film target. The short-cut process—also based on para xylene—may be more economical than other procedures currently being used.

American Cyanamid's recently unveiled diarylethane process for making dimethylstyrene from acetaldehyde and a petroleum grade xylene has the meta xylene isomer reacting preferentially, thus leaving a para xylene enriched mixture. This is more possible grist for the Dacron. Mylar mill.

Meta More Quiet: Less spectacular than para xylene in its market gyrations is the meta isomer. No news to the trade is the fact that Oronite has been experimenting the last two or three years with a meta-derived isophthalic acid (IPA). What did jar

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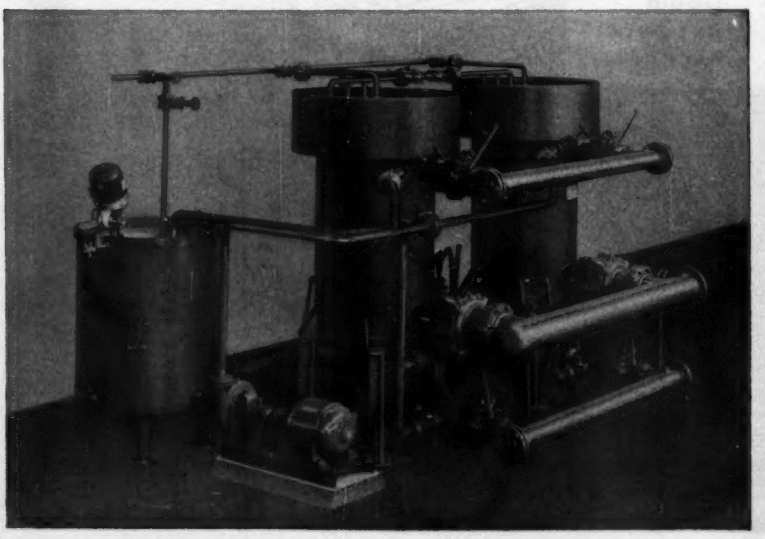

some phthalic anhydride makers, though, was the announcement a few weeks ago (*CW, Market Letter, Sept. 19*), that Oronite's parent company, Standard of California, is ready to sink some $10 million in a 50 million lbs./year IPA installation.

Though it's still a question whether the plant will be built on the East or West Coast, the decision has already been made to shave IPA's premium to a mere 2-3¢/lb. over the going phthalic price. The meta outlet will not only compete directly with phthalic anhydride in surface coatings and polyester laminating resins, but is also being touted for some applications beyond the phthalic scope.

American Cyanamid, too, is interested in any future need for a pure meta isomer. In the diarylethane process mentioned above, the cracking step produces a meta xylene of high purity. Ordinarily, it is recycled to the process but, hints American Cyanamid broadly, the meta may one day be made available at a reasonable cost.

Petro Para-Xylene

	Capacity (Est.) (million lbs.)
1950	2
1951	5
1952	8
1953	65
1954	80
1955	100

Isophthalic's emergence as a large-scale chemical will provide—for Oronite at least—a profitable outlet for all three of its mixed xylenes. For notwithstanding the new iso production, Oronite will not curtail—and may even increase—its phthalic-from-ortho operations.

Ample But Good: Looking at the xylene isomer picture as a whole, this much stands out: The petroleum industry's current and prospective expansion is just beginning to take the wraps off a hitherto retarded chemical development of the xylene fractions. But now, in spite of any persistent high demand for aviation gasoline, or sustained toluene requirements, there'll be enough raw material to satisfy any possible exploding demands for the xylene derivatives. Xylenes, at long last, are headed for the chemical big-time.

Here's a One-Man Bulk Materials Handling System for Your Plant...

In the Dempster-Dumpster System of bulk materials handling only one man, the driver of the truck-mounted Dempster-Dumpster, is required for operation. The Dempster-Dumpster serves scores of detachable Dempster-Dumpster Containers. Container capacities range up to 4 times that of conventional dump truck bodies and each container is designed to suit the materials to be handled—be they solids, liquids or dust . . . hot or cold . . . bulky, light or heavy. You simply place these containers at convenient materials accumulation points inside or outside buildings. When loaded each container is picked up, hauled and emptied (as shown above) or load set down intact. Entire operation is handled by hydraulic controls in cab.

Containers shown below are just a few of the many available or that can be built to meet your needs. They enable you to handle, at tremendous savings, materials of many descriptions—trash and waste materials, raw materials, finished products, etc. —with only one truck and only one man, the driver.

Without question, the Dempster-Dumpster System is the most economical and most efficient method of plant materials handling by truck ever devised!

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Dempster-Dumpster Handles Scores
of Containers... All Designs... All Sizes

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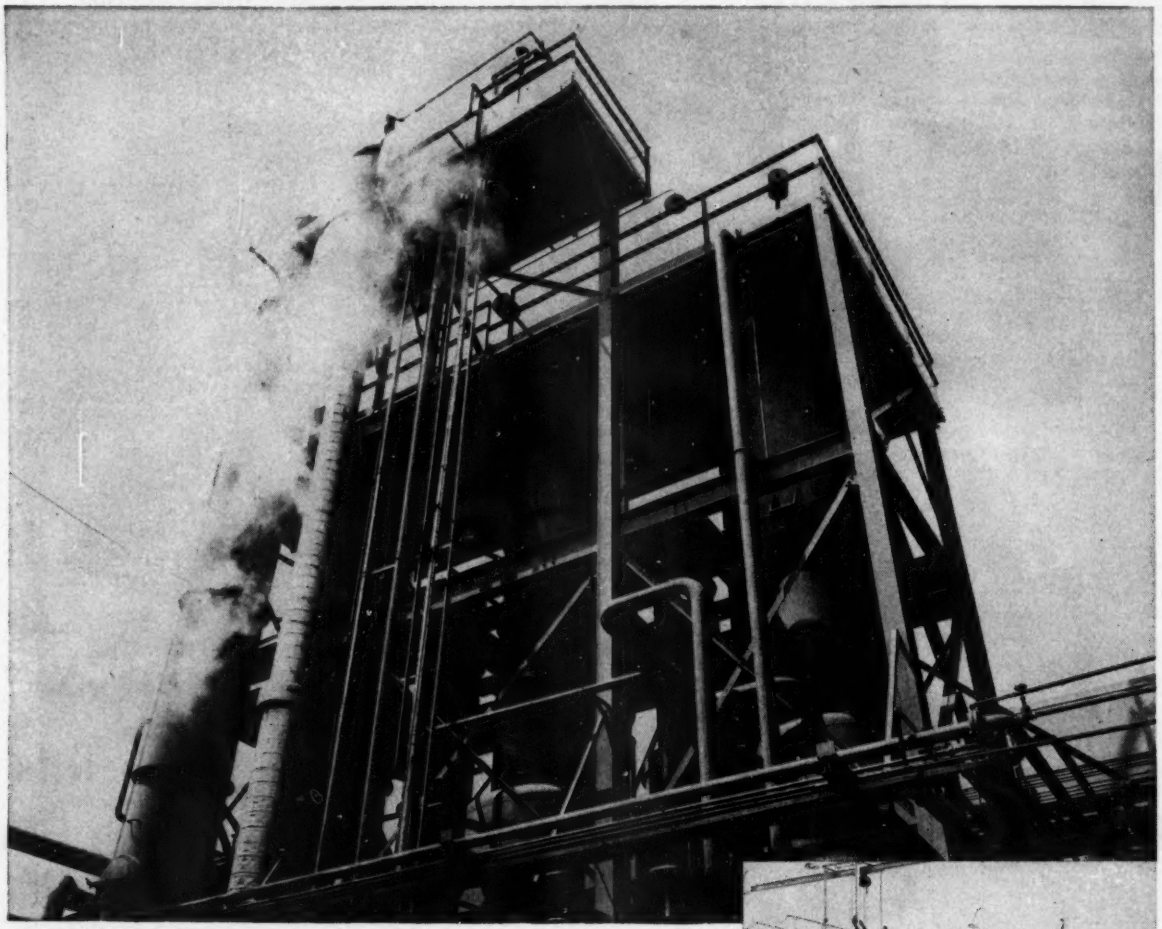

SALT AIR AND CAUSTIC SOLUTIONS—After eighteen months' exposure to moist salt air and frequent cleanings with caustic solutions, these high-vacuum, low-temperature evaporators used in citrus processing are still in excellent condition thanks to the protection of a Parlon-based paint. This paint is Valdura rubber-base enamel, manufactured by American-Marietta Company, Chicago, Ill.

PAINTS THAT STAY ON LONGER

In chemical plants and refineries, sewage disposal plants and water works, paper and textile mills—wherever protective coatings have to take a beating—paints made with Hercules® Parlon (chlorinated rubber) are giving greater long-term protection at lower long-term cost. Whether the challenge comes from acids, alkalies, abrasion or unusual exposure to the elements, Parlon® finishes withstand severe service longer than most other maintenance paints.

Parlon-based paints are easy to apply on any type of surface, and dry almost as fast as lacquer. These chlorinated rubber paints are available from 400 manufacturers under their own brand names. See your regular supplier, or write Hercules.

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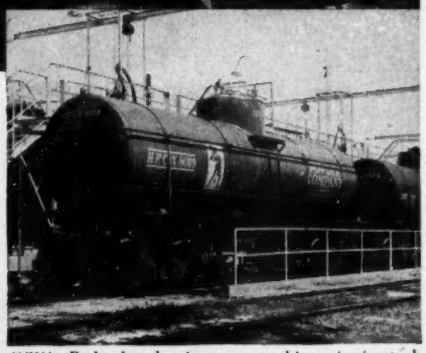
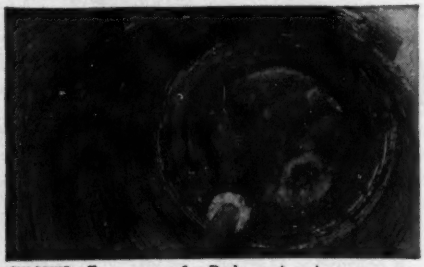


ALKALI—Parlon-based paint protects this rosin-size tank car from alkali spillage. Parlon paints provide durability and washability for acid tanks cars, cement cars, trucks and trailers used in industrial environments. Paint used on the tank car was made by Rexton Finishes, Inc.



CHLORINE—Four coats of a Parlon paint give an average service life of eight years on wooden bleach cell tubes in first-stage chlorinator at Scott Paper Company, Everett, Washington. Parlon paint used is Paron, manufactured by Rudd Paint & Varnish Co., Seattle, Washington.

GC53-6

KIDDE'S WHITNEY: "In the past, they'd design a plant to last 50 years . . .

Design for the Future

If you haven't already done so, you can kiss good-bye to your old ideas on the structures that shelter your chemical processes, says Frank Whitney, forward looking chief engineer for Walter Kidde Constructors. In an interview with CW last week, Whitney explained how architectural concepts must change to keep pace with the changes in manufacturing.

As Whitney sees it, the old idea in building a plant was to design it along majestic lines, to give it a "sort of built-in institutional quality."

"Formerly," he says, "plants were built to last 50 years. And the unfortunate part of it is that very often the old piles did." When the time comes to update the process or expand the plant, the builder is hamstrung, for the processes are entombed in their own monuments.

Time for a Change: The trend now is away from what Whitney calls the "corporate ancestral home." New plants are more flexible; they can be expanded, dismantled or changed with a minimum of effort.

One way to accomplish this is to reduce masonry and use panels more extensively. But some builders resist a wider use of panels. Many of them feel that brick looks better. It is, moreover, a material they're familiar with, the one they've used all their lives. Then, too, many of the paneling materials were developed during the war—or shortly after it—as wartime substitutes. And though the ones now on the market are far superior, many builders remember only the earlier versions.

Whitney sees a bright future for plastic panels, particularly for those made of glass-reinforced polyesters. They've already been used in laboratories and other places and Whitney sees them as eventually playing a big role in industrial building. He points out that they stand up well in corrosive atmospheres, require little maintenance and are easily moved. One drawback has been the fact that they're not fire-resistant but Whitney feels it's just a matter of time before this problem is solved*.

Integration of Equipment: Whitney looks on the ideal manufacturing plant as simply "a shell over machinery." For process industry plants, he goes a step farther, says the structure should be integrated with the equipment.

Petroleum refineries and some chemical plants have already done this. The only place you'll find shelter, says Whitney, is "where it's needed, over the control panels."

"Academically," he says, "architecture is usually defined in terms of its relationship to man. But in a modern process plant, the men move from place to place; they may spend only 20 minutes a day in the building. It's still architecture, but the concept is changing. We now have to define it in terms of the equipment it houses."

What effect will this changing concept have on the cost for buildings? Obviously, you're building less square footage. But by the same token, the cost per square foot is higher and the net result may be insignificant savings.

More important, feels Whitney, is that you make it possible for the process to be revised or the plant expanded with a minimum of effort. Says he, "Any time you put up a new plant, you try to look into the future, to program ahead. But what you're trying to program is 'change' and it can't be done. What you end up doing is a compromise, and many plants are expanded by compromise after compromise. If you look at it carefully, you'll find that it's usually the building that's the bad boy."

. . . and very often the old piles did."

Whitney admits the new concepts don't solve all the problems. You can't completely get away from masonry, and you can't "hang the structure on the equipment" in all cases. "But it's a step," he says, "toward helping the expanding plant."

* Hooker Electrochemical, in fact, recently introduced a family of fire-resistant resins, Hetron chlorinated polyesters, for use in reinforced plastics (*CW, Aug. 1*).

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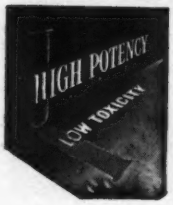

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Make Water Do Double Duty

Plant men who are having trouble finding water to slake their plants' thirsts may be overlooking a bet if they haven't considered the possibility of using sewage effluent, agreed E. B. McCormick of Cosden Petroleum Co. and Otto Wetzel of Purvin & Gertz (Dallas) at the 6th Annual Industrial Health Conference in Houston last fortnight. Cosden does just that at its Big Spring (Tex.) refinery, and the two men outlined the company's experience there.

As do most refineries and many chemical plants, the Big Spring project requires vast amounts of water. In fact, says McCormick, the refinery, whose throughput averages 24,000 bbls./day of crude oil, requires almost half as much water as the city of Big Spring, whose population is about 25,000.

Located in West Texas, Cosden had been getting water from wells near the plant. But it could never get what it needed. And to make matters worse, the water was hard, caused serious scaling problems. What's more, the scale, a sulfate type, was itself extremely hard and the company never did find a solvent for it.

As a result, maintenance costs were high and the plant's onstream efficiency was poor. About the best that could be expected from any piece of equipment, even a boiler, was from 30-60 days of continuous operation.

Turning To Sewage: The solution of its woes was the sewage treatment plant built by the city of Big Spring. Cosden signed a contract with the city stipulating that the water should meet certain specifications on biological oxygen demand as well as suspended solids content. At the start, the water was used only for boiler feed and engine jacket cooling. Treatment was carried out in three steps: using hot process lime, anthracite filtration, and an internal phosphate treatment.

After the wrinkles were ironed out, Cosden found that boiler tube failures were eliminated. Now the boilers are shut down only for routine annual inspection and maintenance.

However, warns McCormick, if you're seriously considering sewage effluent as a source of water, there are several points you should keep in mind:

- Constant water analysis and chemical control present problems because there's a variation in the effluent. Other industries, laundries, filling stations and, in the case of Cosden, an army base, discharge oils, soap and chemicals that find their way into the effluent.
- The city's water source also varies depending on which wells are being pumped, their location and the amount of supplemental lake water being utilized.
- Cosden carries a boiler drum pressure of 170 psi., which is fairly low. If higher pressures were required, it would be necessary to employ break point chlorination to completely destroy the organic matter.
- The hot process method of treating flashes off ammonia, but it's not 100% efficient and some ammonia will be carried over to the steam.
- Because of the ammonia, it's not practical to use standard bronze trim in valves and pumps. Iron or stainless steel trim for equipment in either water or steam service is recommended.

Problems Compound: Although Cosden has been using sewage effluent

What's the Cost?

The costs of treating sewage effluent will, of course, vary with the composition, the hardness, chloride content and the requirements. This is McCormick's breakdown of costs for 1,000 gal. of water at Big Spring:

For Boiler Feed:		For Cooling Tower Make-Up:	
Lime	$0.050	Lime	$0.03
Soda Ash	0.035	Soda Ash	0.02
Phosphate	0.035	Corrosion Inhibitor	0.04
A gel (for suppressing foam)	0.040	Acid and Chlorine	0.03
Cost of effluent plus pumping	0.060	Cost of effluent plus pumping	0.06
Total	$0.22	Total	$0.18

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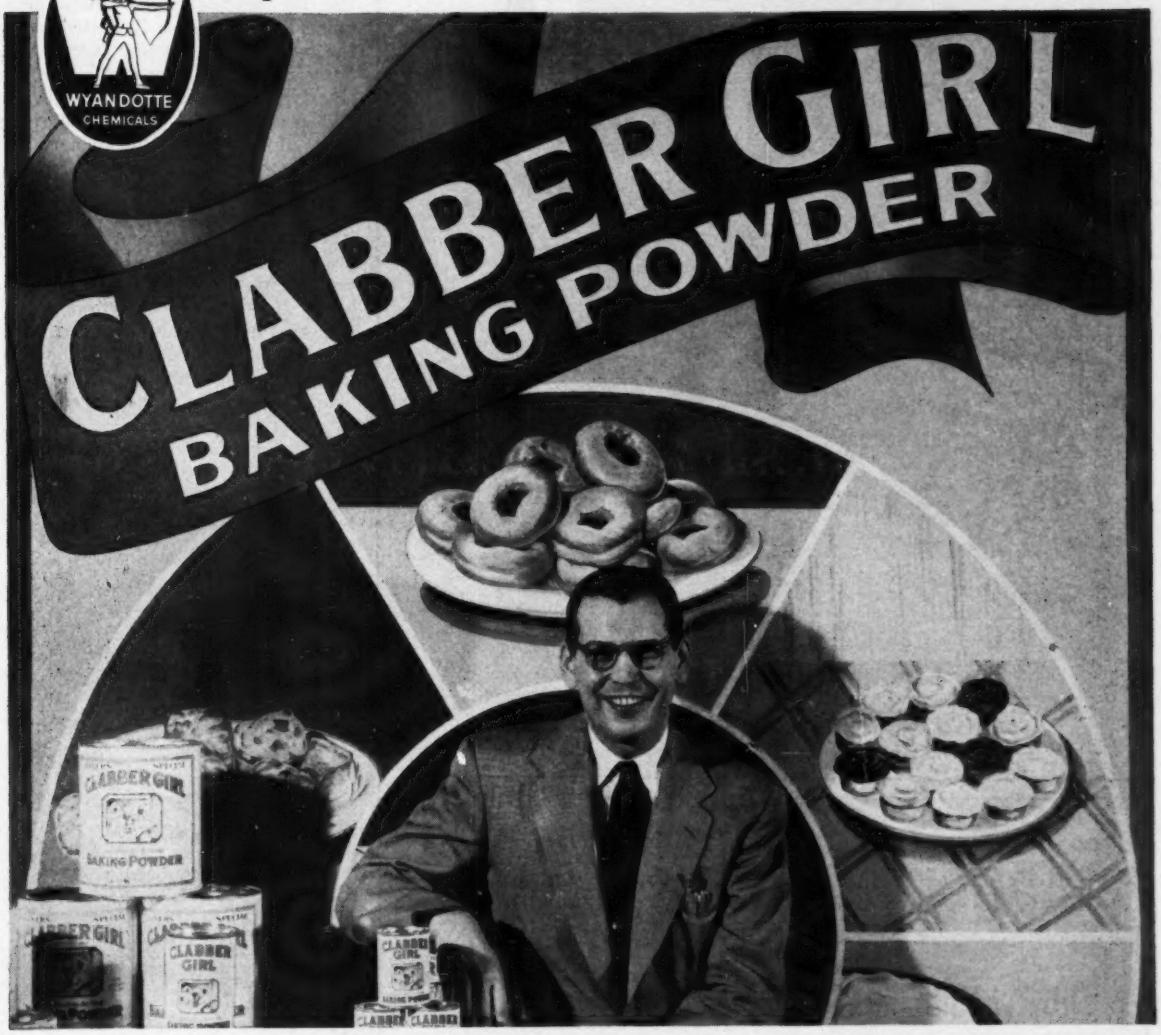

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ent for several years, McCormick points out that when it started using the water, the refinery setup was fairly simple. Vacuum distillation, cat cracking, solvent extracting, alkylation and petrochemical units have since been added. And as the refinery became more complex, the water problems have compounded.

For instance, when the firm originally treated the effluent for cooling tower make-up, it found the hot lime process reduced scaling tendencies but it stimulated the growth of algae. Conventional algaecide treatment worked out fine until recently when more stringent limitations on process temperatures called for more effective algae control.

Now the firm is using a chlorination, but that, in turn, raises a corrosion problem. It's attempting to minimize this by use of inhibitors and McCormick thinks this may prove to be the answer.

COSDEN'S McCORMICK: Sewage effluent slakes a thirst.

Worth Expanding? In his talk on the same subject, Wetzel took substantially the same approach. He pointed out that while Cosden is now encountering some difficulties with its water supply, they're not due to the use of sewage effluent. For example, the city of Big Spring recently changed its source of water. As a result, hardness of the water has doubled, chlorine content has tripled. This has doubled the cost of treating it, has also added to the corrosion problem.

However, as Wetzel points out, the same problem would have arisen if Cosden had been taking the water from the wells.

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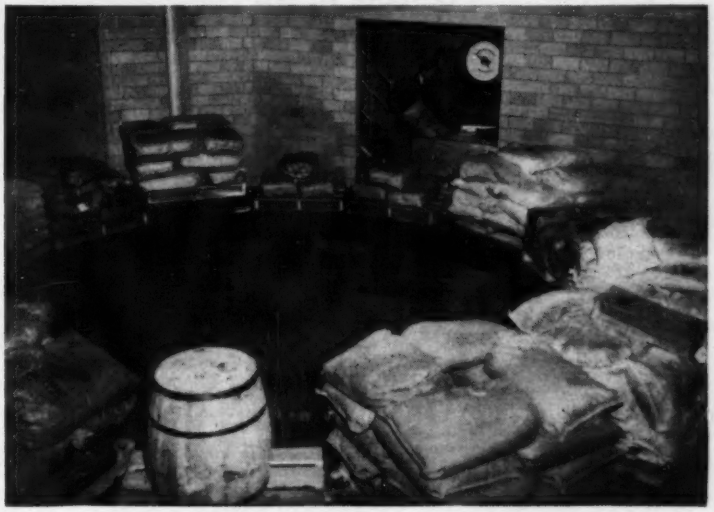
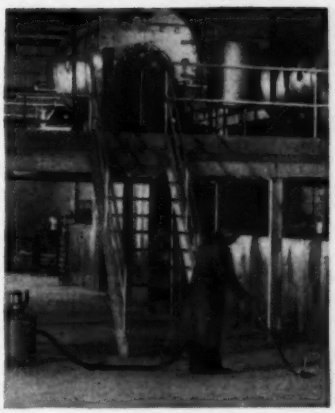


Lazy Susan Goes to Work

IF IT MAKES for a more efficient house, it might also make for a more efficient plant, reasoned A. O. Smith Corp. as it started design of its new welding electrode plant near Lancaster, (Pa.). So it borrowed pages out of the housewife's book.

At the $1-million plant that opened late last month, an operator at a dry-mix station selects what he needs from an industrial "Lazy Susan" while another man (*right*) cleans the plant with an industrial vacuum cleaner. Small particles of grit can cause severe damage in such a plant.



He also thinks that chemical treatment may be the answer to the corrosion problems but warns it may be an expensive one. And, like McCormick, he says that if the firm were building a water treatment plant today it would give thought to the use of a Zeolite unit for final softening rather than the present phosphate treater.

Wetzel points out that the present water shortage is extending to areas other than those that have been considered arid, that large, dependable sources of industrial water are getting hard to find.

His heartening conclusion: since Cosden has proved sewage effluent can be used, other companies and other industries with heavy requirements for process water might find the idea worth trying.

EQUIPMENT . . . .

Plastics Progress: Process uses for plastic shapes make news every week. This week, it's the fluroplastics that are out in front as:

• Nichols Engineering, Inc. (Stratford, Conn.) introduces oil sight glasses made of Kellog's Kel-F fluorocarbon. They're machined from sheets up to ¼ in. thick by techniques, says Nichols, that yield a "glass" of excellent clarity. Nichols sees the fact that they're shatter-proof and corrosion-resistant as big advantages for them. It adds that since Kel-F doesn't pick up dirt, the glasses will obviate the need for frequent clean-outs.

• Plastics Inc. (Bristol, R. I.) is bringing out a pipe dope made of Du Pont's Teflon fluorocarbon. It can be used, says the firm, on pipes of stain-

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PRODUCTION . . . . .

less or nickel steel, chrome-plated metal, polyvinyl chloride and other plastics or hard rubber, on aluminum and glass. Not only is the dope chemically resistant, it adds, but it also acts as a thermal and electrical insulator.

• Eco Engineering Co. (Newark, N. J.) also is introducing a Teflon sealing compound. Dubbed Telefilm, it's recommended for metallic and plastic threaded connections in all types of process pipelines and apparatus.

• And another boost for Kel-F comes from Fisher & Porter Co. (Hatboro, Pa.), which reports that Kel-F diaphragms keep wet chlorine gas in check in its new Ratachlor chlorinator. Unlike other materials tested, Kel-F remained resilient enough under the chlorinator's temperature range to act as its own gasket.

•

New Gauge: General Electric (Schenectady, N. Y.) has developed a new molecular vacuum gauge, which it figures will find a place in chemical processing and laboratory work. Big feature is that it measures pressures without external detectors. Internal detectors are coaxially aligned cylinders. It works on the theory that the rate of transfer of momentum energy from a moving surface to another one, adjacent and parallel, is directly proportional to the gas pressure and to the velocity of the moving surface. Accuracy is said to range from ±1 micron from 0 to 0.01 mm. of mercury to ±0.75 mm. at 15-20 mm. of mercury.

•

Reducing and Regulating: The A. W. Cash Valve Manufacturing Corp. (Decatur, Ill.) has brought out a new series of pressure-reducing and pressure-regulating valves, designed for "dirty" liquids or fluids with high viscosity. The valves incorporate a seat that resembles a universal joint, are said to be dependable, easy to clean and maintain.

•

Changes: New subsidiary, new distributors in the news:

• The H. K. Ferguson Co. (Cleveland) has formed a subsidiary, H. K. Ferguson of Canada, Ltd., headquartered in Montreal.

• U.S. Steel Supply of U.S. Steel Corp. is the new distributor for A. O. Smith welding products on the West Coast. It has warehouses in Los Angeles, San Francisco, Portland (Ore.).

• The Linatex Corp. of America (Rockville, Conn.) has appointed Tonray Equipment Co. (Denver, Col.) as distributor of its products in that area.

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Uses of RCI Products

CANVAS, PAPER AND GLASS CLOTH LAMINATES: PLYOPHEN cresol, phenolic and resorcinol-formaldehyde resins and varnishes; RCI polyester resins.

CARBON PAPER: RCI inorganic chemical pigment colors.

CASTINGS: FOUNDREZ powdered phenolic resins (for the shell molding process); FOUNDREZ liquid phenolic resins and FOUNDREZ core oils (for core binders).

FURNITURE, PLYWOOD, FLOORING, HARDBOARD AND CHIPBOARD: HYDROPHEN phenolic glues; PLYACIEN protein glues; PLYAMINE urea-formaldehyde glues; PLYOPHEN phenolic and resorcinol-formaldehyde glues.

LEATHER: BECKOSOL alkyd resins (for leather finishes); PLYOPHEN resorcinol-formaldehyde resins, SUPER-BECKACITE pure phenolic resins, SYNTHE-COPAL ester gums (for leather adhesives).

LINOLEUM: BECKOSOL alkyd resins and PENTACITE pentaerythritol resins (for linoleum coatings); RCI inorganic chemical pigment colors.

PAINTS, VARNISHES AND LACQUERS: BECKACITE (1) fumaric, (2) maleic and (3) modified phenolic resins; BECKAMINE urea-formaldehyde resins; BECKOLIN synthetic oils; BECKOPOL modified phenolic resins; BECKOSOL (1) phenolated, (2) phthalic-free, (3) rosin modified, (4) pure drying and (5) pure non-drying alkyd resins; KOPOL processed Congo copals; PENTACITE pentaerythritol resins; STYRESOL styrenated alkyd resins; SUPER-BECKACITE pure phenolic resins; SYNTHE-COPAL ester gums; WALLKYD pure drying alkyd resins (for alkyd flat wall vehicles); WALLPOL vinyl-type copolymer latex emulsions (for latex flat wall coatings); RCI inorganic chemical pigment colors.

PAPER: BECKAMINE urea-formaldehyde resins (for adding wet strength, improving the wet rub of starch-clay coatings, and waterproofing starch adhesives); RCI inorganic chemical pigment colors (for paper coloring); STYRESOL styrenated alkyd resins (for paper coating).

PRINTING INKS: BECKACITE fumaric, maleic and modified phenolic resins; BECKOLIN synthetic oils; BECKOPOL modified phenolic resins; RCI inorganic chemical pigment colors.

TYPEWRITER RIBBONS: RCI inorganic chemical pigment colors.

WAXES AND POLISHES: BECKACITE modified phenolic and maleic resins; SUPER-BECKACITE pure phenolic resins; SYNTHE-COPAL ester gums.

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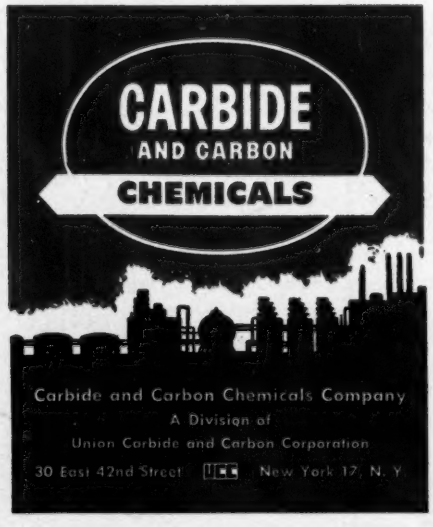

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